

**Sonos, Inc.'s Opp'n to Google LLC's
Motion *In Limine* No. 2**

EXHIBIT A

(Filed Under Seal)



OCEAN TOMO[®]

A PART OF JS|HELD

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

CIVIL ACTION NO. 3:20-cv-06754

GOOGLE LLC,

v.

SONOS, INC.

SUPPLEMENTAL EXPERT REPORT OF JAMES E. MALACKOWSKI

December 9, 2022



A detailed listing of documents reviewed by Ocean Tomo in connection with this litigation to date is included in Appendix 2-S. References to documents and testimony herein are meant to provide examples of supporting information but are not intended to be a comprehensive or exhaustive list of all known support. In addition to this report, I may rely on video excerpts taken from videotaped depositions and/or demonstrative exhibits that illustrate the concepts and conclusions contained in this report. Such excerpts and/or demonstratives have not yet been prepared.

In connection with my work in this matter I have assumed that the Asserted Patents are valid, enforceable, and infringed. That assumption is made exclusively for the purpose of calculating damages in this matter and in no way represents a legal conclusion. The opinions discussed throughout this report are based on my current understanding of the facts and circumstances surrounding this matter, my review of the produced documentation, testimony, third party information available to date, and any underlying assumptions upon which I have relied. As such, the analyses and opinions described herein are subject to change based upon additional discovery or any other relevant development. I reserve the right to submit a supplemental report if both necessary and allowed by the Court.

3. SUMMARY OF OPINIONS

Based on the totality of the circumstances in this case and the information available to me at this time, I have concluded that the appropriate form of compensation in this case, for each of the Asserted Patents, is an award of reasonable royalty damages.

I have analyzed quantitative and qualitative valuation metrics, including the *Georgia-Pacific* factors, and have reached a conclusion regarding the appropriate reasonable royalties due Sonos. Regarding the '033 Patent relating to Direct Control, in my opinion, the total royalty rate is [REDACTED]¹⁹ Alternatively, the royalty rate for the '033 Patent based on comparable technology found in other casting apps is [REDACTED]. Reasonable royalties due Sonos for the '033 Patent amount to [REDACTED], alternatively, [REDACTED]

Regarding the Zone Scene Patents, in my opinion, the total royalty rate is \$0.87 for the '885 Patent and \$0.82 for the '966 Patent, resulting in damages of \$12.2 million and \$144.4 million, respectively.²²

¹⁹ Appendices 5.1.1 and 5.1.2-S. [REDACTED].

²⁰ Appendix 6.2.

²¹ Appendices 3.3-S and 6.1. Alternatively, if one were to base the reasonable royalty on incremental margin, the reasonable royalty for the '033 Patent would amount [REDACTED]. See, Appendix 5.2-S.

²² Appendix 3.1-S.



INTELLECTUAL CAPITAL EQUIITY

Figure 1-S: Summary of Direct Control Reasonable Royalty Damages²³

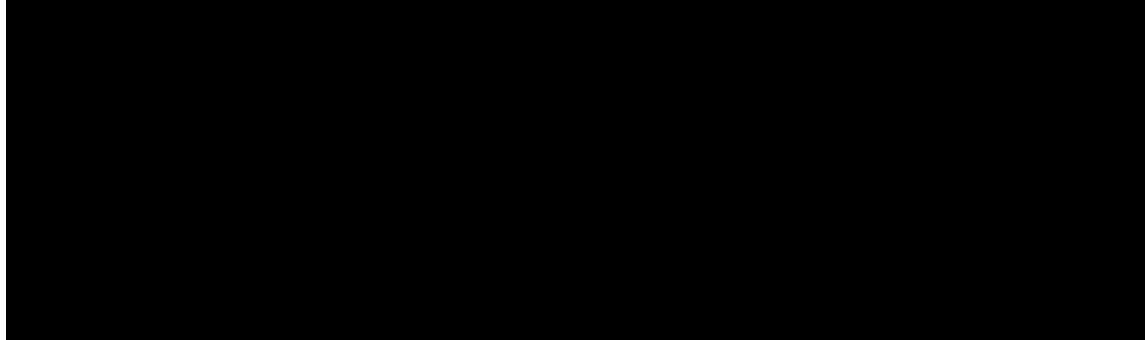
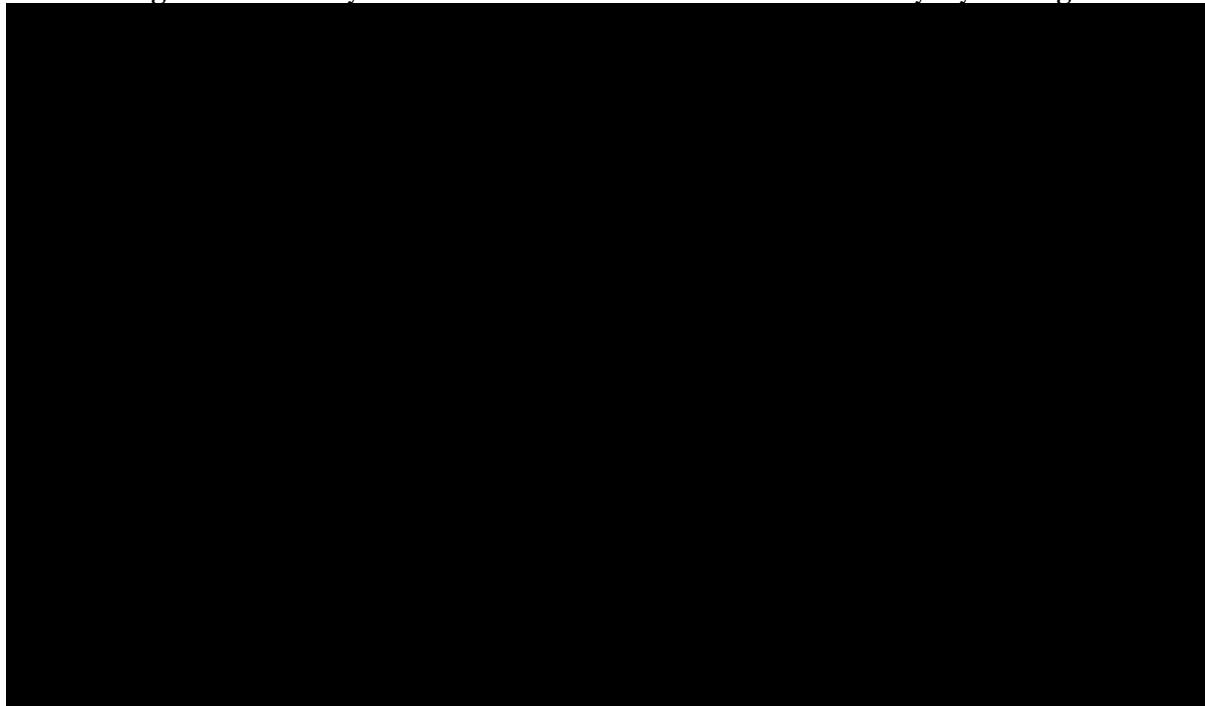
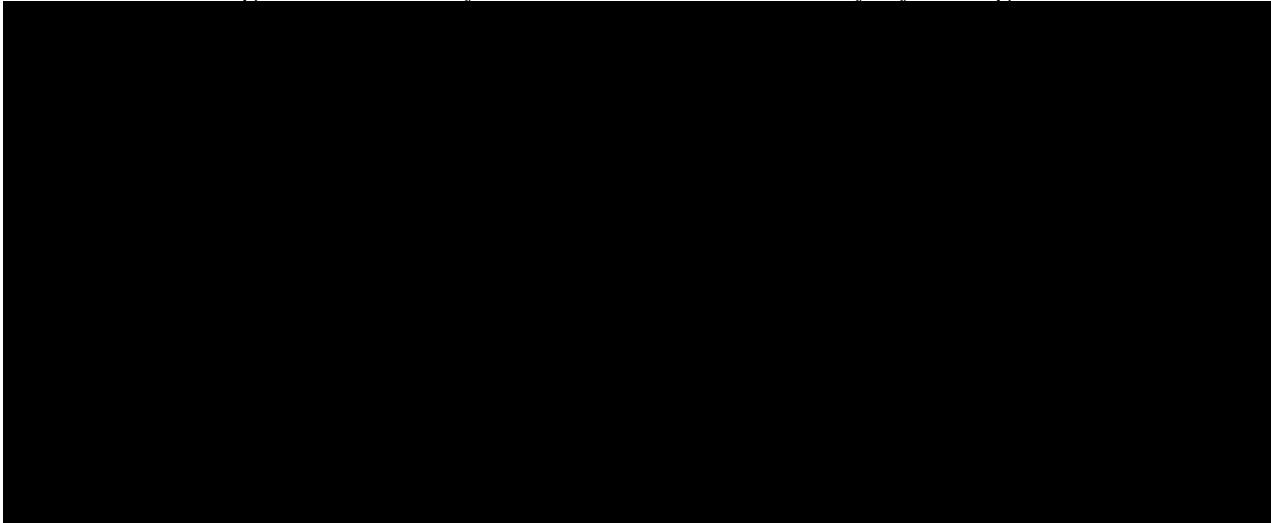


Figure 2: Summary of Alternative Direct Control Reasonable Royalty Damages²⁴



²³ Appendix 3.3-S.

²⁴ Appendix 6.1.

**Figure 3-S: Summary of Zone Scene Reasonable Royalty Damages²⁵**

4. RELEVANT PARTIES

4.1 Sonos, Inc.



Sonos, currently headquartered in Santa Barbara, California, was founded in 2002 (originally as Rincon Audio, Inc.)²⁶ with a goal to transform the home sound system for the digital age.²⁷ Sonos designs, develops, manufactures, and sells audio products in the Americas, Europe, the Middle East, Africa, and the Asia Pacific area.²⁸ The company's products include items such as wireless speakers,²⁹ home theater speakers, components, and other accessories for audio systems.³⁰ Sonos sells its products through third-party retail stores, which include custom installers of home audio systems, e-commerce retailers, and through their own website, Sonos.com.³¹

Sonos is an American success story. It was founded by a handful of engineers and entrepreneurs with a vision to invent the world's first wireless, whole-home audio system. At the time, popular audio systems were dependent on a centralized receiver hard-wired to each individual passive speaker throughout a home. Further, most homes with Internet access had dial-up connections, the iPhone was still five years away,

²⁵ Appendix 3.1-S.

²⁶ "Sonos, Inc. – Public Company Profile," *CapitalIQ*, S&P Global Market Intelligence.

²⁷ "Sonos, Inc. – Public Company Profile," *CapitalIQ*, S&P Global Market Intelligence; SONOS-SVG2-00062368-369 at 368.

²⁸ "Sonos, Inc. – Public Company Profile," *CapitalIQ*, S&P Global Market Intelligence.

²⁹ I may refer to "speakers" generally throughout my report and reference to speakers may include any audio playback device, including devices which assist with audio playback and may not necessarily include a speaker (for instance, the Sonos Port, which is a network audio streamer), such as an all-in-one device (for instance, the Sonos One).

³⁰ Sonos changed its name in May 2004. "Sonos, Inc. – Public Company Profile," *CapitalIQ*, S&P Global Market Intelligence.

³¹ "Sonos, Inc. – Public Company Profile," *CapitalIQ*, S&P Global Market Intelligence.



8.3 '966 Accused Instrumentalities

I understand that for the '966 Patent, the Accused Instrumentalities are composed of computing devices provisioned with the Google Home app.¹⁷¹ The Google Home app can be installed on user devices running different operating systems, such as Android (which runs on Android devices, such as Google's Pixel devices), iOS (which runs on Apple's devices), and chromeOS (which runs on Chromebooks).¹⁷² These user devices include popular smartphone devices, such as the Samsung Galaxy, the Apple iPhone, and the Google Pixel, as well as popular tablets and laptops, such as the Apple iPad and Google Chromebook. Accordingly, I understand that the Accused Instrumentalities include any and all smartphones, tablets, and computers that are installed with the Google Home app ("the '966 Accused Instrumentalities").

I understand, based on the testimony of Christopher Chan, that access to the Google Home app is a requirement to set up a Google smart speaker (and static speaker group).¹⁷³ Since any and all smartphones, tablets, or computers installed with the Google Home app are infringing devices, I have considered the number of infringing devices to be represented by the number of Google Home app installations during the relevant infringement period. I understand that Google has provided data regarding U.S.-based installations of the Google Home app on Android devices for January 2019 through November 15, 2022; this data represents "someone installing the Google Home app."¹⁷⁴ For the data provided covering the infringement period, November 5, 2019 through November 15, 2022, there were approximately [REDACTED] infringing Android installs.¹⁷⁵ I note that this number is conservative as it only includes new installs of the Google Home app and does not include any updates of the Google Home app on controller devices during the relevant infringement period. For example, if the Google Home app was installed on a controller device prior to the infringement period, but the Google Home app was updated (and effectively re-installed) on a controller device during the infringement period, such controller device is excluded from my damages calculations.

I understand that the Google Home app can also be downloaded on non-Android devices, such as iOS devices like the iPhone and iPad. Christopher Chan testified that the only differences between the Android and iOS versions of the Google Home app were iOS support for widgets and aesthetics (or layout).¹⁷⁶ To estimate the number of non-Android device downloads over the same period, I divide the number of infringing installs in a certain quarter by the share of smartphone devices running the Android operating system in the U.S. This calculation, and the result of [REDACTED] total infringing installs, is shown in the figure below.

Figure 6: '966 Accused Instrumentalities – Google Home App Installs¹⁷⁷

¹⁷¹ Opening Almeroth Report, pp. 8-10.

¹⁷² Opening Almeroth Report, pp. 8-10.

¹⁷³ Deposition of Christopher Chan, November 29, 2022, p. 91.

¹⁷⁴ GOOG-SONOSNDCA-00071316; Deposition of Christopher Chan, November 29, 2022, pp. 40-42.

¹⁷⁵ Appendix 7.4.

¹⁷⁶ Deposition of Christopher Chan, November 29, 2022, pp. 80-82.

¹⁷⁷ Appendix 7.4.



Similar to my own opinions, it is my understanding that Mr. Bakewell opines that this agreement “does not provide a useful benchmark.”⁴²⁷

Therefore, it is my opinion that this purchase agreement is not economically comparable to the license that would result from the hypothetical negotiation in this case, nor is it indicative of the appropriate reasonable royalty rate that would be agreed to by the parties to the hypothetical negotiation.

12.1.5 Comparable Applications

In lieu of directly comparable licensing agreements for the Asserted Patents I have considered a similar Market Approach analysis which looks to comparable software applications providing similar technological functionality as the Asserted Patents. While I have identified a comparable subscription-based software company which provides similar functionality to the Zone Scene technology, I have instead performed an Income Approach method to identify the value Google receives for the Direct Control technology. However, I have also identified a number of comparable applications which provide similar technological functionality as Direct Control and the ’033 Patent.

The applications which I reviewed are all offered on the Google Play Store. Based upon my initial review and layperson’s understanding of the technology, I identified a number of applications which provide casting-functionality. I then provided this list of applications to Dr. Schmidt who separately reviewed and confirmed each application’s technical comparability to the ’033 Patent and the Direct Control functionality. This analysis assumes that in the hypothetical negotiation, Sonos is acting as an application developer who provides Google with the fundamental technology to offer an application on the Google Play Store. The applications which were identified as being comparable are listed in the figure below.

⁴²⁵ GOOG-SONOSNDCA-00055165-177 at 167.

⁴²⁶ GOOG-SONOSNDCA-00055165-177 at 167.

⁴²⁷ Bakewell Rebuttal Report, p. 155.



12.2.3 Direct Control Quantitative Indicator Conclusion

Based upon the reasonable royalty indicators calculated above, I believe the appropriate starting point for the *Georgia-Pacific* analysis is [REDACTED], based upon the incremental YouTube advertising and subscription revenue royalty quantitative indicator.⁴⁸⁰

12.2.4 Zone Scene Reasonable Royalty Indicator

As described above, Google does not earn substantial income on the sales of the '885 Accused Instrumentalities themselves, but instead relies on the functionality to increase the number of users and amount of time those users are interacting with the Google ecosystem in an effort to generate additional advertising revenue. Therefore, I have considered an approach under which Sonos, as the technology developer, would charge Google a fee to implement this technology into its products.

I have investigated the offerings of a third-party company, If This Then That ("IFTTT") which provides similar, albeit less valuable, functionality as Sonos's patented Zone Scene technology.

12.2.4.1 IFTTT Background

IFTTT is a web-based service that allows its users to create sequential chains of simple conditional statements, comprised of "if" statements ("triggers"), which check for a condition, and "then" statements ("actions"), which act upon a service based upon the returned value of the trigger.⁴⁸¹ For example, IFTTT offers pre-made applets that allow a consumer to integrate across applications, devices, and services to perform functions such as: determining the temperature of your home using the current weather conditions, activating a security system upon leaving home, and voice-activation of a device.⁴⁸²

I understand that Dr. Almeroth has reviewed IFTTT and provided input regarding its technical comparability to the claimed technology in the '885 Patent:

I have been asked to review the "Applets" provided by "IFTTT" to determine whether they are technologically comparable to the claimed technology of the '885 and '966 Patents. According to the IFTTT website, "IFTTT is short for If This Then That, and is the best way to integrate apps, devices, and services." To provide such integration, IFTTT offers "Applets" that have "a combination of triggers and actions that can be combined to create the automations that help you achieve your goals, be more efficient, and improve your smart home." For example, a first IFTTT Applet can be programmed and saved with routines or actions, which are executed with the press of a first button, to play music on multiple smart speakers in a home. Similarly, a second Applet can be programmed and saved with routines or actions, which are executed with the press of a second button, to play music on at least one of the speakers in the first Applet together with at least one different speaker (not included in the first Applet) in the same home.

⁴⁸⁰ \$1.39 = [REDACTED]. See Appendices 5.1.1.1 and 5.1.2.1-S.

⁴⁸¹ "IFTTT – Trust, Ownership, Control and Business Model," *Mere Civilian*, <https://www.merecivilian.com/ifttt/#:~:text=IFTTT%20has%20stated%20that%20there%20are%20over%202000%2C00,expensive%20tiers%20and%20any%20revenue%20from%20IFTTT%20partners>.

⁴⁸² "WTF is IFTTT?" *IFTTT*, https://ifttt.com/explore/new_to_ifttt.



In this regard, the IFTTT Applets are technologically comparable to the “zone scene” technology claimed in the ’885 and ’966 Patents. That is, these Applets can be used to create and save a predefined group of playback devices, such as speakers, that can later be invoked to cause such devices to playback the same song. These saved groups can also be named according to a common theme, such as “Garden,” “Morning,” “Afternoon,” and “Evening.” Moreover, the Applets allow for these predefined groups to include overlapping playback devices and to be capable of playing back the same song.

It should be understood, however, that the IFTTT Applets do not perform each and every limitation of the claims of the ’885 and ’966 Patents and do not provide the full scope of advantages explained above. As one non-limiting example, these Applets do not enable the creation of groups of speakers that are “configured for synchronous playback of media” when invoked, as required by limitations 1.6 and 1.7 of claim 1 of the ’885 Patent and limitations 1.5 and 1.7 of claim 1 of the ’966 Patent. As such, unlike the ’885 and ’966 Patents’ claimed technology, the smart speaker groups created via these IFTTT Applets do not provide the advantage of synchronous audio playback because the smart speakers in a group created and invoked with an IFTTT Applet would have unwanted echo (e.g., echo caused by clock drift between the smart speakers and/or echo caused by differences in the playback start time of the audio on each smart speaker).

Nevertheless, it is my opinion that, while the technology incorporated into the IFTTT Applets may be inferior to the claimed technology of the ’885 and ’966 Patents, the IFTTT Applets are technologically comparable to the claimed “zone scene” technology of the ’885 and ’966 Patents.⁴⁸³

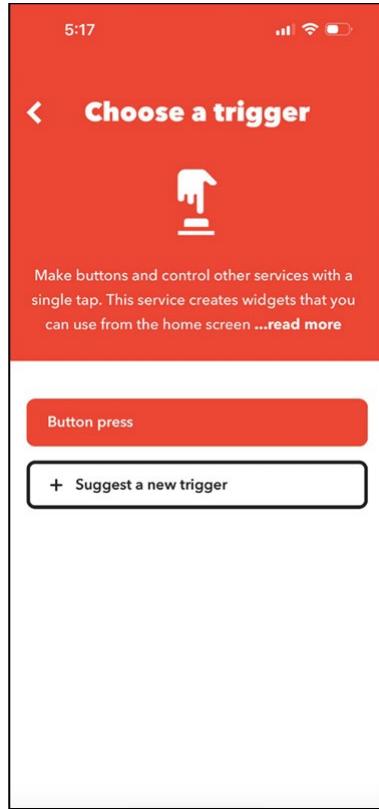
I understand that while asserted claim 1 is directed to and infringed by a single “zone player” with certain functional capability, the claim recites three separate “zone players” (e.g., speakers), two separate groups or zone scenes, and one common or overlapping “zone player” at a minimum.⁴⁸⁴

To help with building an applet, IFTTT offers pre-made triggers and actions. One such pre-made trigger is the “Button press,” which can prompt numerous workflows and automations, as shown in the figure below.⁴⁸⁵

⁴⁸³ Opening Almeroth Report, pp. 384-385, 395. Internal cites omitted.

⁴⁸⁴ Opening Almeroth Report, pp. 264-265.

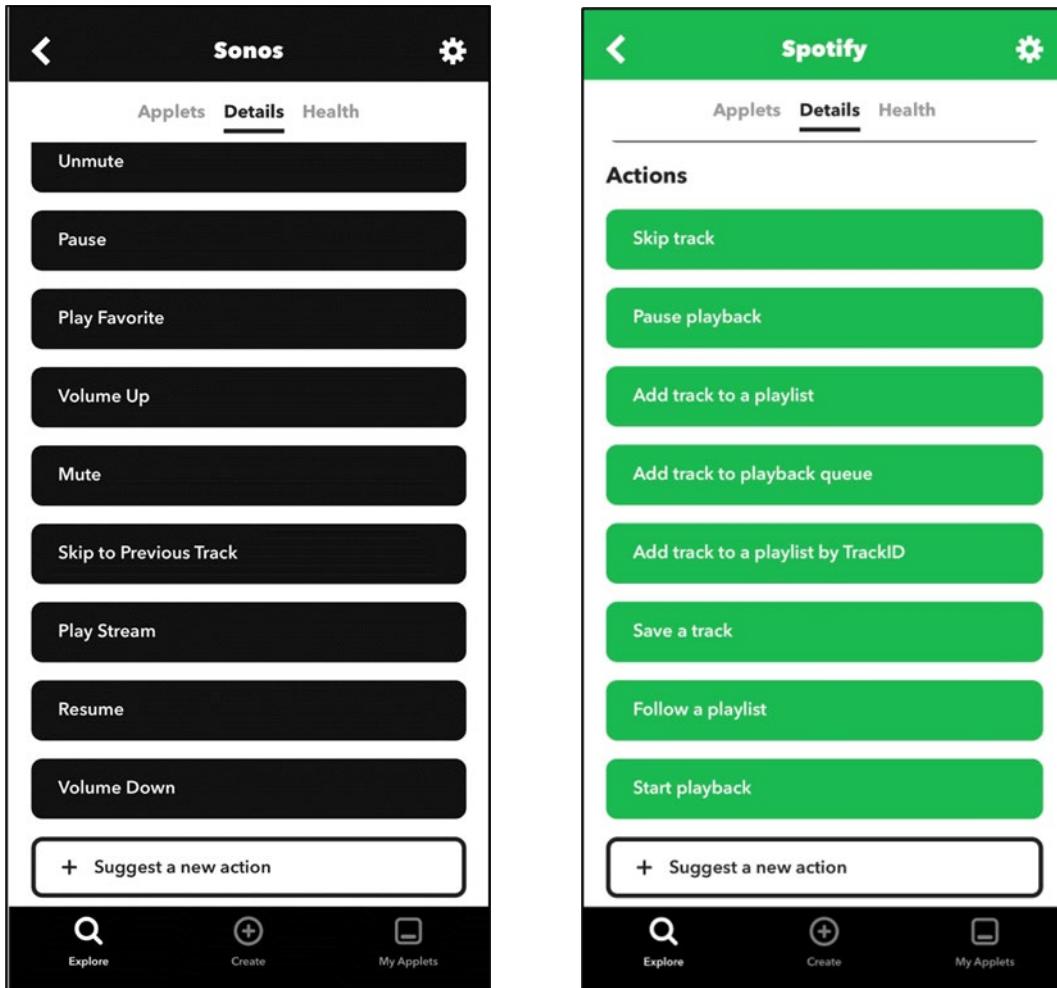
⁴⁸⁵ Opening Almeroth Report, pp. 386-387.

Figure 32: Trigger Choice⁴⁸⁶

Next, the user selects the actions which occur once the “Button press” is activated. The user can select “Start playback” from their Spotify account and/or “Resume” from their Sonos speakers, as shown in the figures below.⁴⁸⁷

⁴⁸⁶ Opening Almeroth Report, p. 386.

⁴⁸⁷ Opening Almeroth Report, p. 387.

Figure 33: Adding Actions to an Applet⁴⁸⁸

Using these pre-made offerings, an IFTTT user may build an applet by choosing the “Button press” trigger, choosing an action for resuming or playing music on a first speaker, and choosing an action for resuming or playing music on a second speaker. Once a user has chosen the trigger and actions for his or her applet, the IFTTT application allows the user to name and save the applet.⁴⁸⁹ The user can name the button or action sequence to name the speaker group, to options such as “Garden” to designate location or “Evening” to designate a timeframe. I understand that while this creation does not sync the music played back by the speakers in the group, this applet does pre-define, name, and save a group of speakers that can be recalled for playback at a later time, as well as provides the option to include the same speaker in multiple, different speaker groups.⁴⁹⁰ I understand that Dr. Almeroth oversaw and directed certain testing to further understand

⁴⁸⁸ Opening Almeroth Report, p. 387.

⁴⁸⁹ Opening Almeroth Report, pp. 388-389.

⁴⁹⁰ Opening Almeroth Report, pp. 386-395.



IFTTT's operational and functional capabilities, including building, creating, saving, and invoking different groups of speakers.⁴⁹¹

Given these abilities, I find that, contrary to Dr. Schonfeld's claim that "the technology contained within IFTTT is totally unrelated to the technology of the '885 Patent," the IFTTT service allows a user to create, name, and save a speaker group for later recall, providing comparable functionality to the Asserted Claims of the '885 Patent.⁴⁹² Dr. Schonfeld also argues that IFTTT is "does not appear targeted at facilitating or suggesting grouping of speakers...because the whole point of IFTTT is to allow a user to access a huge number of apps and create a near-infinite number of applets that automate tasks for users."⁴⁹³ I do not disagree with Dr. Schonfeld that IFTTT offers immense capabilities outside of the ability to group speakers, such as "creating notifications based on the Weather Underground app, [...] which has nothing in common with the alleged invention."⁴⁹⁴ However, my analysis of the IFTTT service is merely the first step in my analysis in calculating a quantitative indicator for the Zone Scene technology; it does, despite Dr. Schonfeld's opinion, allow for a user to create similar, albeit less valuable, speaker groups similar to those contemplated in the Zone Scene Patents. As such, IFTTT's ability to charge for the ability to create this service provides an initial indicator to the value of the Zone Scene Patents.

12.2.4.2 IFTTT Pricing History

From its inception through September 2020, IFTTT offered services to its users for free, with no limitations in terms of speed, applet count, or access. In September 2020, IFTTT rolled out two subscription plans: "Standard" and "Pro."⁴⁹⁵ At that time, the "Standard" plan would allow users to turn on unlimited applets and to create up to three applets, but did not allow "multi-step applets."⁴⁹⁶ The "Standard" subscription had no monthly fee.⁴⁹⁷ At the same time, the "Pro" plan provided users with unlimited applet creation, multi-step applets with queries, conditional logic statements, and multiple actions (*i.e.*, "if-then-then" statements), exclusive customer support, and faster execution.⁴⁹⁸ Initially, IFTTT's initial pricing model for the "Pro" subscription gave users the ability to set their price as one of four options: \$3.99, \$5.99, \$9.99, and custom.⁴⁹⁹ The custom field allowed users to input the price they wanted to pay, as long as it was at least \$1.99 per month.⁵⁰⁰ The creator of IFTTT thought the true value of the technology was \$9.99 per month, and it was

⁴⁹¹ Opening Almeroth Report, pp. 386-395.

⁴⁹² Rebuttal Expert Report of Dan Schonfeld, Ph.D., July 27, 2022, p. 37.

⁴⁹³ Rebuttal Expert Report of Dan Schonfeld, Ph.D., July 27, 2022, pp. 38, 45.

⁴⁹⁴ Rebuttal Expert Report of Dan Schonfeld, Ph.D., July 27, 2022, pp. 38, 45.

⁴⁹⁵ "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.

⁴⁹⁶ "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.

⁴⁹⁷ "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.

⁴⁹⁸ "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.

⁴⁹⁹ Hearn, P., "IFTTT Pricing: Is Pro Worth The Cost?" *Online Tech Tips*, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>; Varughese, A., "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.

⁵⁰⁰ Hearn, P., "IFTTT Pricing: Is Pro Worth The Cost?" *Online Tech Tips*, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>; Varughese, A., "How much does IFTTT Cost?" *Automate Your Life*, <https://automatelife.net/how-much-does-ifttt-cost/>.



expected that eventually the lower subscription fees would be phased out.⁵⁰¹ This “Set your price” payment model only lasted from September 2020 through the end of October 2020.⁵⁰²

Figure 34: IFTTT “Pro” Subscription Pricing – September 2020⁵⁰³

2. Payment options

Set your price /month

\$3.99 \$5.99 **\$9.99** \$
(\$1.99 USD or more)

For a limited time, you may set your price for IFTTT Pro and we will honor it indefinitely. All subscriptions are in US\$ and renew monthly.

As of November 2020, IFTTT still offered the same “Standard” and “Pro” plans, but the pricing for the “Pro” subscription had changed.⁵⁰⁴ Rather than allow users to set the price, the “Pro” subscription was only offered at \$3.99 per month.⁵⁰⁵

In November 2021, IFTTT began offering three subscription plans: “Free”, “Pro”, and “Pro.”⁵⁰⁶ As of November 2022, IFTTT still offers the same three plans, but at lower price points.⁵⁰⁷ The “Free” plan allows users to create up to five applets, run at standard applet speeds, make and use published applets, unlimited applet runs, free mobile access, and simple no-code integrations.⁵⁰⁸ Like the “Standard” plan, the “Free” plan does not allow users to create “multi-action applets.” The “Pro” plan, priced at \$2.50 per month, allows users to create up to twenty applets, run at increased applet speeds, create multi-action applets, and have access to customer support.⁵⁰⁹ The “Pro+” plan, priced at \$5.00 per month, allows users to create unlimited applets, have access to every “Pro” subscription feature, connect multiple accounts, use queries and filter code, access developer tools, and have access to priority customer support.⁵¹⁰

⁵⁰¹ Hearn, P., “IFTTT Pricing: Is Pro Worth The Cost?” *Online Tech Tips*, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>.

⁵⁰² Hearn, P., “IFTTT Pricing: Is Pro Worth The Cost?” *Online Tech Tips*, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>; “Find the right plan,” *IFTTT*, <https://web.archive.org/web/20201103212957/https://ifttt.com/plans>.

⁵⁰³ Hearn, P., “IFTTT Pricing: Is Pro Worth The Cost?” *Online Tech Tips*, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>.

⁵⁰⁴ “Find the right plan,” *IFTTT*, <https://web.archive.org/web/20201103212957/https://ifttt.com/plans>.

⁵⁰⁵ “Find the right plan,” *IFTTT*, <https://web.archive.org/web/20201103212957/https://ifttt.com/plans>.

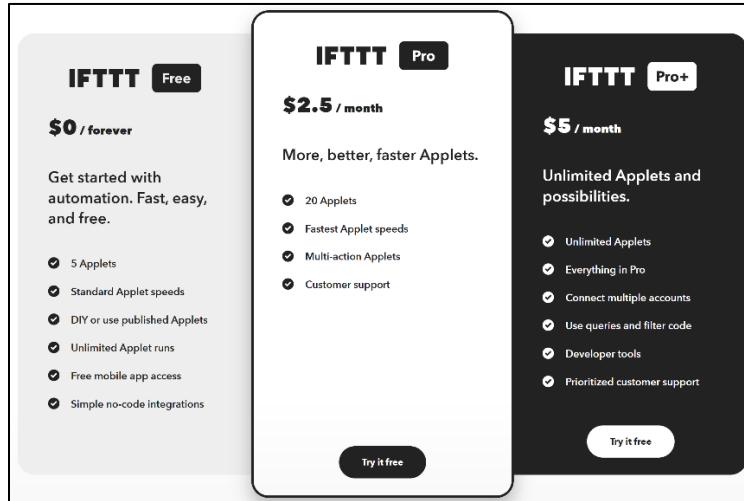
⁵⁰⁶ “Find the plan for you,” *IFTTT*, <https://web.archive.org/web/2021111223804/https://ifttt.com/plans>.

⁵⁰⁷ “Find the plan for you,” *IFTTT.com*, <https://ifttt.com/plans>.

⁵⁰⁸ “Find the plan for you,” *IFTTT.com*, <https://ifttt.com/plans>.

⁵⁰⁹ “Find the plan for you,” *IFTTT.com*, <https://ifttt.com/plans>.

⁵¹⁰ “Find the plan for you,” *IFTTT.com*, <https://ifttt.com/plans>.

Figure 35: IFTTT “Free,” “Pro,” and “Pro+” Subscription Pricing – November 2022⁵¹¹

12.2.4.3 Zone Scene Reasonable Royalty Quantitative Indicator

IFTTT's ability to provide similar functionality to the zone scene technology relies on the creation of two multi-action applets. I understand that IFTTT is both easy to use and requires no technical expertise.⁵¹² To help with building an applet, IFTTT offers pre-made triggers and actions. For example, IFTTT offers a trigger called “Button press,” actions for Sonos devices including “Resume” playback and a “Start playback” action for Spotify.⁵¹³

Using these pre-defined offerings, IFTTT users can build an applet to resemble the functionality of the zone scene technology in at least two different methods using the “Button press” trigger:

- 1) Choosing an action for resuming/playing music on a first Sonos speaker, and choosing an action for resuming/playing music on a second Sonos speaker;⁵¹⁴ or
- 2) Choosing an action for starting playback of Spotify music on a first speaker, such as a Google or Amazon speaker, and choosing an action for resuming/playing music on a second speaker, such as a Sonos speaker.⁵¹⁵

I understand that an IFTTT user may create multiple applets using one or more overlapping speakers between each applet. Specifically, a user may create one applet utilizing a first speaker and a second speaker, and also create a second applet which utilizes a first speaker and a third speaker, with each speaker in a group set up to play back the same song as the others in that group. The IFTTT user is also allowed to name and

⁵¹¹ “Find the plan for you,” *IFTTT.com*, <https://ifttt.com/plans>.

⁵¹² SONOS-SVG2-00224846-850 at 846, 848; SONOS-SVG2-00227578-583 at 580; SONOS-SVG2-00227600-604 at 600, 602.

⁵¹³ SONOS-SVG2-00224846-850 at 848; SONOS-SVG2-00227605-606; SONOS-SVG2-00227613-614.

⁵¹⁴ SONOS-SVG2-00227566.

⁵¹⁵ SONOS-SVG2-00227570.



save each applet.⁵¹⁶ To activate the IFTTT applets, the user simply activates the “Button press” trigger (which can be saved, for example, as a widget on an iPhone home screen), which then implements one of the three methods listed above, causing a group of speakers to play a song. In other words, *if* the “Button press” trigger is activated, *then* the relevant Sonos or Spotify actions are executed, resulting in a group of speakers playing a song.⁵¹⁷

As such, IFTTT provides for a portion of the zone scene functionality contemplated by the Asserted Claims of the ’885 Patent and ’966 Patent. Specifically, the actions described above allow an IFTTT user to program, name, save, and then activate a first group of speakers for music playback, as well as program, name, save, and activate a second group of speakers for music playback, where there is at least one overlapping speaker between the first speaker group and second speaker group. The speakers in each group can also be set up to play the same song. However, I understand IFTTT is unable to enable the entire functionality contemplated in the Asserted Claims of the ’885 Patent and ’966 Patent. For example, music that is played through a speaker group via an IFTTT applet is not synced.

The “Pro” subscription is the cheapest plan that allows users to create two multi-action applets, thereby replicating the functionality of zone scene technology. Given that, I have assumed that the “Pro” subscription fee would be an appropriate starting point for determining what Sonos would charge Google as a per-device royalty for each of the Zone Scene Patents.

Around the time of the hypothetical negotiation for the ’885 Patent, in November 2020, the “Pro” subscription cost \$3.99 per month, or \$11.97 per quarter. In September 2020, a few months before the hypothetical negotiation, users were given the option of selecting their own subscription fee, as long as it was at least \$1.99 per month. I understand this was the first instance in which IFTTT users were asked to pay for the services provided by IFTTT applets.⁵¹⁸ In order to be conservative, I have provided a range of “Pro” subscription fees as a starting point including the lowest fee IFTTT offered of \$1.99 per month (\$5.97 per quarter) as a low price and the next lowest offered price, which was \$3.99 per month (\$11.97 per quarter), as a high price.

Around the time of the hypothetical negotiation for the ’966 Patent, in November 2019, the “Pro” subscription was provided at no cost to IFTTT users. As stated above, IFTTT users were first asked to pay for IFTTT services for the first time in September 2020, with the option to subscribe to the “Pro” plan for as little as \$1.99 per month. I believe that the parties would understand that IFTTT would not be able to offer its services for free indefinitely, and the initial prices offered would be known or knowable at the time of the hypothetical negotiation for the ’966 Patent. In order to be conservative, I use \$1.99 per month, the lowest IFTTT “Pro” plan price offered as a starting point to my reasonable royalty analysis for the ’966 Patent; this results in \$5.97 per quarter.

⁵¹⁶ SONOS-SVG2-00227592; SONOS-SVG2-00227584-585.

⁵¹⁷ Opening Almeroth Report, pp. 386-395.

⁵¹⁸ “IFTTT.com Plans,” *Wayback Machine*, <https://web.archive.org/web/20200930053720/https://ifttt.com/plans>; Hearn, P., “IFTTT Pricing: Is Pro Worth The Cost?” Online Tech Tips, <https://www.online-tech-tips.com/software-reviews/ifttt-pricing-is-pro-worth-the-cost/>.



I understand that IFTTT's "Pro" subscription currently gives a user the ability to create 20 applets, however, the functionality that replicates zone scene technology can be accomplished on just two applets. Therefore, I apportion IFTTT's "Pro" subscription fees by a factor of 2/20 (10%) to get a low per-device subscription fee of \$0.60 per quarter and a high per-device subscription fee of \$1.20 per quarter for the '885 Patent.⁵¹⁹ For the '966 Patent, I apportion the IFTTT "Pro" subscription fee by the same factor (2/20).

Figure 36: Quarterly IFTTT Subscription Fees for Comparable Zone Scene Technology⁵²⁰

	<u>Low</u>	<u>High</u>
IFTTT "Pro" Price Subscription	\$ 5.97	\$ 11.97
Apportionment Metric	<u>10.0%</u>	<u>10.0%</u>
Quarterly Subscription Fee for Comparable Zone Scene Functionality	<u>\$ 0.60</u>	<u>\$ 1.20</u>

IFTTT subscriptions would continue indefinitely as long as the user stays subscribed to the service. However, I have only considered the lifetime value of one smartphone as the total time that the zone scene subscription fee would be applicable. The average lifetime value of a smartphone (*i.e.*, a Google Pixel phone) is two and a half years or ten quarters.⁵²¹ Therefore, I applied the quarterly subscription fee for zone scene to the lifetime value of a smartphone, ten quarters, and then discounted those fees by Google's weighted average cost of capital ("WACC") at the time of the hypothetical negotiation, of 7.4% and 8.8% for the '885 Patent and '966 Patent, respectively, to calculate the NPV of the lifetime value of zone scene technology per device.⁵²² Using the low quarterly subscription fee, the NPV of lifetime value of zone scene technology per device is \$4.27 for the '885 Patent and \$4.04 for the '966 Patent.⁵²³ Using the high quarterly subscription fee, the NPV of lifetime value of zone scene technology per device is \$8.56 and \$8.09.⁵²⁴

⁵¹⁹ Appendices 4.4 and 4.3.

⁵²⁰ Appendix 4.3.

⁵²¹ Jesper, "What is the average lifespan of a smartphone?" *CoolBlue.nl*, <https://www.coolblue.nl/en/advice/lifespan-smartphone.html>; Chng, R., "How Long Can A Smartphone Last? (With 6 Real Examples)," *Valorvortech.com*, <https://valorvortech.com/how-long-can-a-smartphone-last/>; "Average lifespan (replacement cycle length) of smartphones in the United States from 2014 to 2025," *Statista.com*, <https://www.statista.com/statistics/619788/average-smartphone-life/>.

⁵²² Google's weighted average cost of capital as of Q4 2020 and Q4 2019 was 7.4% and 8.8%. *Bloomberg Terminal*, accessed November 18, 2022. Appendices 4.1.4 and 4.2.4.

⁵²³ Appendices 4.1.4 and 4.2.4.

⁵²⁴ Appendices 4.1.4 and 4.2.4.

Figure 37: NPV of Lifetime Value of '885 Patent Per Device⁵²⁵

Low	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Quarterly Subscription Fee for '885 Patent - Low	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60
Partial Period Factor	0.101	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.899
Mid-Period Factor	0.051	0.551	1.601	2.601	3.601	4.601	5.601	6.601	7.601	8.601	9.551
Present Value Factor	0.996	0.961	0.892	0.831	0.773	0.720	0.670	0.624	0.581	0.541	0.506
Present Value	\$ 0.06	\$ 0.57	\$ 0.53	\$ 0.50	\$ 0.46	\$ 0.43	\$ 0.40	\$ 0.37	\$ 0.35	\$ 0.32	\$ 0.27
NPV of Lifetime Value of '885 Patent Per Device - Low	\$ 4.27										
High	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Quarterly Subscription Fee for '885 Patent - High	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20
Partial Period Factor	0.101	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.899
Mid-Period Factor	0.051	0.551	1.601	2.601	3.601	4.601	5.601	6.601	7.601	8.601	9.551
Present Value Factor	0.996	0.961	0.892	0.831	0.773	0.720	0.670	0.624	0.581	0.541	0.506
Present Value	\$ 0.12	\$ 1.15	\$ 1.07	\$ 0.99	\$ 0.93	\$ 0.86	\$ 0.80	\$ 0.75	\$ 0.70	\$ 0.65	\$ 0.54
NPV of Lifetime Value of '885 Patent Per Device - High	\$ 8.56										
NPV Inputs											
NPV Date	24-Nov-20										
Year End	31-Dec-20										
Partial Period	0.101										
Discount Rate	7.4%										

Figure 38: NPV of Lifetime Value of '966 Patent Per Device⁵²⁶

Low	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022
Quarterly Subscription Fee for '966 Patent - Low	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60	\$ 0.60
Partial Period Factor	0.153	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.847
Mid-Period Factor	0.077	0.577	1.653	2.653	3.653	4.653	5.653	6.653	7.653	8.653	9.577
Present Value Factor	0.994	0.953	0.870	0.799	0.735	0.675	0.621	0.571	0.524	0.482	0.446
Present Value	\$ 0.09	\$ 0.57	\$ 0.52	\$ 0.48	\$ 0.44	\$ 0.40	\$ 0.37	\$ 0.34	\$ 0.31	\$ 0.29	\$ 0.23
NPV of Lifetime Value of '966 Patent Per Device -	\$ 4.04										
High	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022
Quarterly Subscription Fee for '966 Patent - High	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20	\$ 1.20
Partial Period Factor	0.153	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.847
Mid-Period Factor	0.077	0.577	1.653	2.653	3.653	4.653	5.653	6.653	7.653	8.653	9.577
Present Value Factor	0.994	0.953	0.870	0.799	0.735	0.675	0.621	0.571	0.524	0.482	0.446
Present Value	\$ 0.18	\$ 1.14	\$ 1.04	\$ 0.96	\$ 0.88	\$ 0.81	\$ 0.74	\$ 0.68	\$ 0.63	\$ 0.58	\$ 0.45
'966 Patent Per Device -	\$ 8.09										
NPV Inputs											
NPV Date	5-Nov-19										
Year End	31-Dec-19										
Partial Period	0.153										
Discount Rate	8.8%										

As discussed above, I understand that while asserted claim 1 of the '885 Patent is directed to and infringed by a single “zone player” with certain functional capability, the claim recites three separate “zone players” (e.g., speakers), two separate groups or zone scenes, and one common or overlapping “zone player” at a

⁵²⁵ Appendix 4.1.4.

⁵²⁶ Appendix 4.2.4.



minimum.⁵²⁷ Of the people who own a smart speaker in the U.S., 29% have three or more smart speakers.⁵²⁸ Applying a 29% apportionment to the NPV of the lifetime value of zone scene technology per device leads to low and high zone scene quantitative indicators of \$1.24 and \$2.48 for the '885 Patent and \$1.17 and \$2.35 for the '966 Patent, respectively.⁵²⁹

Figure 39: Per-Device Zone Scene Quantitative Indicators for the '885 Patent⁵³⁰

Metric	Low	High
NPV of Lifetime Value of '885 Patent Per Device	\$ 4.27	\$ 8.56
Apportionment Metric - Share of Households with Zone Scene Capability	<u>29.0%</u>	<u>29.0%</u>
'885 Patent Quantitative Indicator	<u>\$ 1.24</u>	<u>\$ 2.48</u>

Figure 40: Per-Device Zone Scene Quantitative Indicators for the '966 Patent⁵³¹

Metric	Low	High
NPV of Lifetime Value of '966 Patent Per Device	\$ 4.04	\$ 8.09
Apportionment Metric - Share of Households with Zone Scene Capability	<u>29.0%</u>	<u>29.0%</u>
'966 Patent Quantitative Indicator	<u>\$ 1.17</u>	<u>\$ 2.35</u>

12.3 Cost Approach

As described in Economic Damages in Intellectual Property:

*The cost approach values assets based on the cost to create and develop the assets. The premise behind the cost approach is that no party involved in an arm's-length transaction would be willing to pay more to use the property than the cost to replace the property. In the context of patents, for instance, a potential licensee would not pay more to license a patent than the cost to design around the technology contributed by the patent. An alternative to designing around the technology would be to purchase the technology. Accordingly, a potential licensee would not pay more to license the technology than it would have to pay to purchase or create the technology.*⁵³²

⁵²⁷ Opening Almeroth Report, pp. 27-28.

⁵²⁸ "The Smart Audio Report – Spring 2020," NPR, slide 9, https://www.nationalpublicmedia.com/uploads/2020/04/The-Smart-Audio-Report_Spring-2020.pdf.

⁵²⁹ Appendices 4.1.3 and 4.2.3.

⁵³⁰ Appendix 4.1.3.

⁵³¹ Appendix 4.2.3.

⁵³² Slottje, D., "Economic Damages in Intellectual Property," pp. 291-293.



enabled media players) compete against Sonos's media players in the WMRS market.⁵⁴⁸ I have not relied on any market share lost by Sonos to Google in my analyses.

Finally, my damages calculations are conservative because I have not included all of Google's direct infringement in my analyses. For instance, I have not included the infringing products that Google imports into the United States but does not sell in the United States (*e.g.*, they are sold in Canada and Mexico).⁵⁴⁹ Although Google has yet to produce the financial information for such imports, there are presumably thousands of such products, if not millions. I have also not included any of the infringing products that Google does not sell but uses internally for its employees and testing. Google had over 185,000 employees worldwide as of September 30, 2022 with 48% of its revenue coming from the U.S. in the same quarter.⁵⁵⁰ Consequently, Google receives a significant benefit from using these infringing products.

14. GEORGIA-PACIFIC FACTOR ANALYSIS

The hypothetical negotiation is to be evaluated in the context of the specific business facts and circumstances faced at that time by the patentee and the prospective licensee. *Georgia-Pacific Corp. v. United States Plywood Corp.* provides a 15-factor framework to perform such an analysis.⁵⁵¹ For each of the 15 *Georgia-Pacific* factors, I have identified the relevant information and facts that may have influenced the royalty rate in the hypothetical negotiation. I note that to some extent, certain of the *Georgia-Pacific* factors have already been addressed in connection with my analysis above.

14.1 Factor #1: The royalties received by the patentee for the licensing of the patent-in-suit, proving or tending to prove an established royalty.

Factor #1 represents a quantitative valuation metric associated with the determination of a reasonable royalty. Analysis of this factor is sometimes referred to as the Market Approach in the context of intellectual property valuation, which I have addressed above in Section 12.1. As discussed above, the Market Approach attempts to measure the value of an intangible asset by drawing inferences from actual market transactions involving that asset or similar assets. In general, the more similar those market transactions are to the transaction in question (*i.e.*, the hypothetical negotiation), the more useful the information. While exactly matching transactions cannot always be found, they do exist in some situations. In the absence of an exactly matching transaction, market transactions that share some characteristics with the subject transaction can provide guidance as to the terms and conditions that may be applicable in a particular case.

I have considered the agreements produced by Sonos in this case, as discussed in the Market Approach. Notably, Sonos's licenses include [REDACTED] [REDACTED] The royalty rates included in these [REDACTED] [REDACTED] licenses are greater than the quantitative indicators I have calculated related to Direct Control and Zone Scene because of the other technologies Sonos owns.

⁵⁴⁸ SONOS-SVG2-00055658; SONOS-SVG2-00055659.

⁵⁴⁹ Deposition of Michael Maigret, May 13, 2022, pp. 51-54.

⁵⁵⁰ Alphabet Form 10-Q for the period ending September 30, 2022, pp. 37, 40.

⁵⁵¹ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).



[REDACTED], which would include a license to the Asserted Patents, would therefore represent a royalty rate ceiling which Sonos and Google would determine is appropriate at the hypothetical negotiation.

In my opinion, there is no comparable license agreement with a grant as narrow as the hypothetical negotiation. Therefore, the Sonos licenses do not inform the royalty rate beyond acting as a ceiling to the hypothetical negotiation. However, the structure of Sonos's past licenses indicate that Sonos prefers running royalties on unit sales over a lump sum payment.⁵⁵² Regardless, my analysis is agnostic to the structure of the running royalty, and I do not believe that the choice of either royalty structure would affect the outcome of the hypothetical negotiation.

Impact on Hypothetical Negotiations: Considered in Quantitative Analysis

14.2 Factor #2: The rates paid by the licensee for the use of other patents comparable to the patent-in-suit.

Factor #2 also relates to the Market Approach and considers licenses entered into by the licensee which may provide relevant insight into the hypothetical negotiation. I have considered the agreements which have been produced by Google in this case in the Market Approach. Each of the agreements produced by Google are not economically comparable to the hypothetical negotiation in this case.

Unlike the hypothetical license, [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

⁵⁵² SONOS-SVG2-00042905-922 at 910; SONOS-SVG2-00042923-944 at 927-928.

⁵⁵³ [REDACTED]

⁵⁵⁴ Section 12.1.2.

⁵⁵⁵ GOOG-SONOSNDCA-00069849-851; GOOG-SONOSNDCA-00069847-848; GOOG-SONOSNDCA-00069846; GOOG-SONOSNDCA-00069845.



[REDACTED] In contrast to Sonos, the structure of Google's historical agreements indicate that Google prefers lump-sum payments over running royalty structures.⁵⁵⁶ Regardless, my analysis is agnostic to the structure of the running royalty, and I do not believe that the choice of either royalty structure would affect the outcome of the hypothetical negotiation.

Therefore, the impact of this factor is reflected in my quantitative analysis described above in Section 12.1.

Impact on Hypothetical Negotiation: Considered in Quantitative Analysis

14.3 Factor #3: The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.

I have considered the hypothetical negotiation would have resulted in a non-exclusive license that would: 1) have been unrestricted as to customers or territory; 2) cover products covered by the asserted claims made, used, sold, or offered for sale in the U.S.; and 3) cover sales made outside of the U.S. only to the extent such sales touch the U.S. and/or are otherwise implicated by U.S. patent laws. Although it would have been a relevant consideration to the hypothetical negotiation, I do not believe it would have placed either party in a relatively stronger bargaining position.

Additionally, I have already considered, in my analysis of the Market Approach, the extent to which the relevant license agreements encompass a broader scope than a non-exclusive, unrestricted bare patent license to the Asserted Patents.

Therefore, I find that this consideration would tend to have a neutral influence in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Neutral

14.4 Factor #4: The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.

I am unaware of any official licensing policy document created by Sonos to "maintain [its] patent monopoly."⁵⁵⁷ However, its past licensing actions demonstrate a desire to maintain and enforce its patent monopoly.

Specifically, Sonos litigated against Lenbrook and Denon and [REDACTED]

[REDACTED] In addition, Sonos has sent Google [REDACTED] with the goal to "obtain a royalty rate that reflects the value attributable to the features of Google's products that are covered by the Sonos patent portfolio."⁵⁵⁸ Sonos's activism in identifying infringing use in the market demonstrates that Sonos wishes to keep its patent monopoly.

⁵⁵⁶ Sections 12.1.2-12.1.4.

⁵⁵⁷ Section 12.1.1.

⁵⁵⁸ SONOS-SVG2-00041807-860 at 807, 809.



Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Licensor

14.5 Factor #5: The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.

Licenses to competitors generally contain a higher royalty rate to compensate for the risk of potential lost sales and/or market share; whereas licenses to entities with an inventor/promoter relationship generally contain lower royalty rates to account for the promoter being able to distribute the product to customers that the inventor would not typically be able to reach.

Google's first WMRS product, the Chromecast Audio, was released in 2015. While this product did not yet include multi-room audio streaming, Google was working to implement the feature in the future:

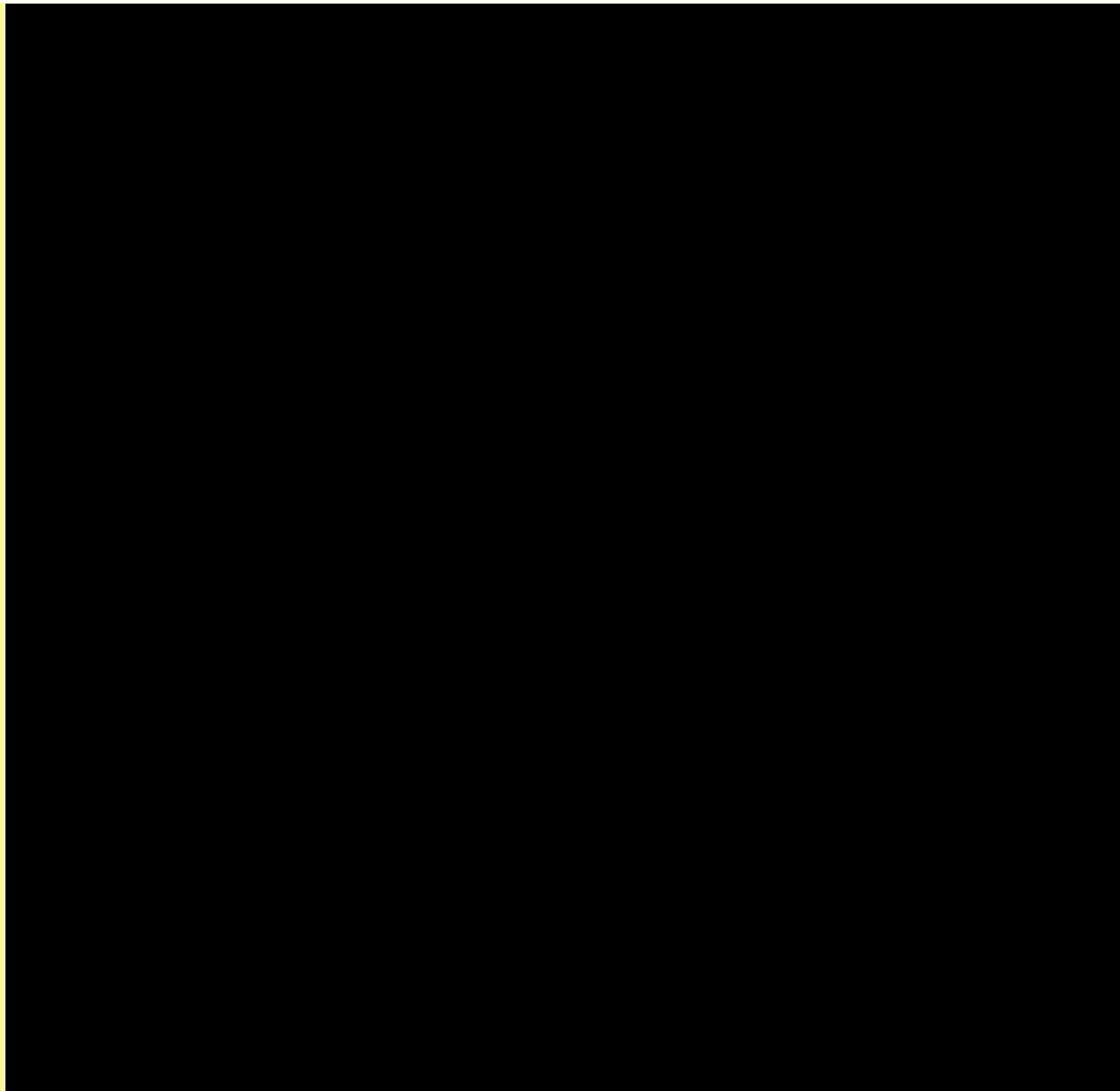
Google's recently-launched Chromecast Audio adapter is getting a major feature update this week: Consumers will now be able to group multiple Chromecast audio adapters to stream their favorite music simultaneously in more than one room, similar to the multi-room support available for internet-connected loudspeakers like the ones made by Sonos.⁵⁵⁹

After the release of the Chromecast Audio, Google released the Google Home which was an "all-in-one" audio player making it more akin to Sonos's prior Play:1, Play:3, and Play:5 products. With respect to these products, Google is competing with Sonos. [REDACTED]

[REDACTED]

⁵⁵⁹ Roettgers, J., "Google's Chromecast Audio Adapter Gets Multi-Room Support Similar to Sonos," *Variety.com*, <https://variety.com/2015/digital/news/chromecast-audio-multiroom-grouping-1201657931/>.

⁵⁶⁰ SONOS-SVG2-00053537-574 at 545.



From Google's perspective, [REDACTED]

[REDACTED] 563

[REDACTED] 564

Figure 43: [REDACTED]

⁵⁶¹ SONOS-SVG2-00053537-574 at 545.

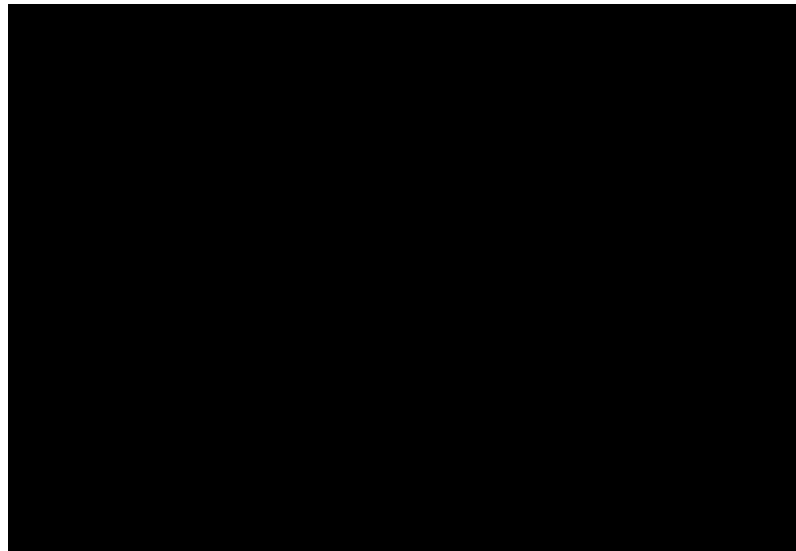
⁵⁶² SONOS-SVG2-00053537-574 at 543.

⁵⁶³ GOOG-SONOSNDCA-00056500-572 at 502.

⁵⁶⁴ GOOG-SONOSNDCA-00056500-572 at 502.



INTELLECTUAL CAPITAL EQUITY

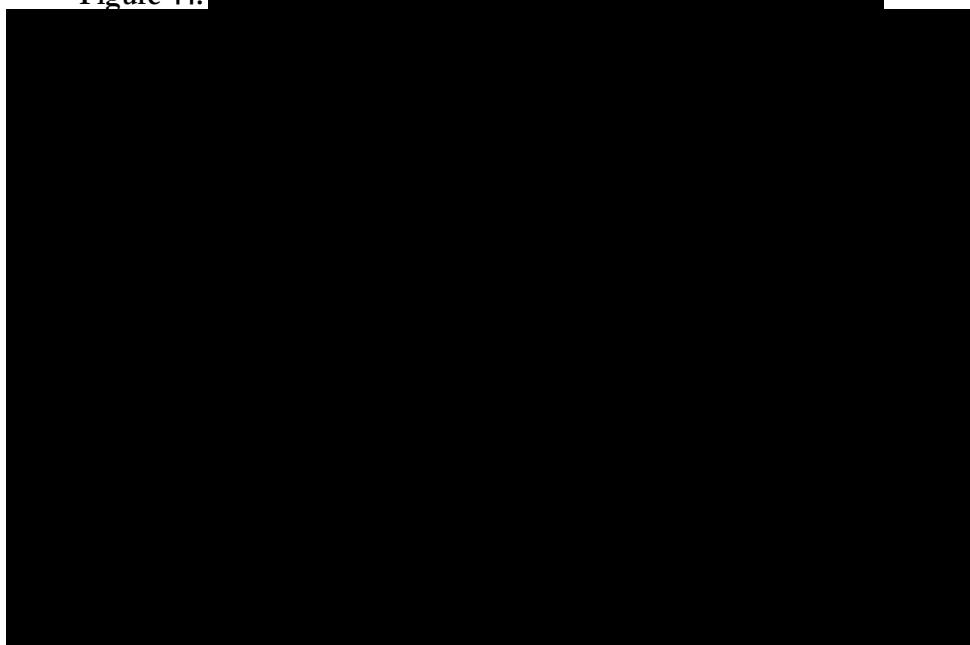


In addition to [REDACTED]

[REDACTED] 565

Figure 44:

566



⁵⁶⁵ GOOG-SONOSNDCA-00056242-243 at 242.

⁵⁶⁶ GOOG-SONOSNDCA-00056242-243 at 242.



INTELLECTUAL CAPITAL EQUITY

Another workbook produced by Google indicates that

The document shows

67

Google even includes [REDACTED]. For example, multiple 2019 presentations indicate that respondents were asked to [REDACTED] Google also performed a conjoint survey analysis that included [REDACTED] and [REDACTED] as possible categories, as shown in the figure below.⁵⁶⁹

Figure 45:

570

The knowledge of

, as indicated in the questions below:

571

572

Various other internal Google documents I have reviewed demonstrate

567 GOOG-SONOSNDCA-00056658.

⁵⁶⁸ GOOG-SONOSNDCA-00056267-305 at 279; GOOG-SONOSNDCA00056306-347 at 316.

⁵⁶⁹ GOOG-SONOSNDCA-00056580-600 at 583.

⁵⁷⁰ GOOG-SONOSNDCA-00056580-600 at 583.

⁵⁷¹ GOOG-SONOSNDCA-00056235-241 at 236.

⁵⁷² GOOG-SONOSNDCA-00056348-369 at 356.



A June 2019 internal Google document [REDACTED]

[REDACTED] 574

In an internal Google document regarding [REDACTED]

[REDACTED] 575

Google produced a [REDACTED]

⁵⁷⁶ This demonstrates Google's desire to [REDACTED]

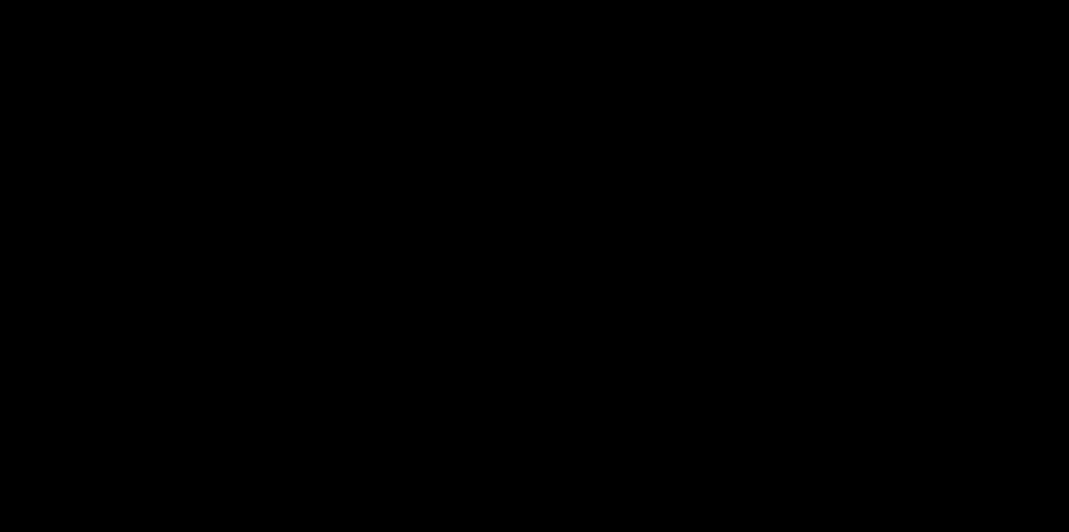
In an internal Google document, there is a [REDACTED]

[REDACTED].⁵⁷⁷ In a Google Home review document, the press compared the Google Home to the Sonos Play:1 which "was superior in every way."⁵⁷⁸ Another internal document [REDACTED]

[REDACTED] 79

Figure 46:

[REDACTED] 580



A large rectangular area of the page has been completely blacked out with a thick redaction bar at the top and bottom, obscuring several paragraphs of text.

[REDACTED] .⁵⁸¹

⁵⁷³ GOOG-SONOSNDCA-00056244-266 at 252.

⁵⁷⁴ GOOG-SONOSNDCA-00056244-266 at 259.

⁵⁷⁵ GOOG-SONOSNDCA-00056267-305 at 279.

⁵⁷⁶ GOOG-SONOSNDCA-00056420-499.

⁵⁷⁷ GOOG-SONOSNDCA-00056658.

⁵⁷⁸ GOOG-SONOSNDCA-00058647-666 at 652-653.

⁵⁷⁹ GOOG-SONOSNDCA-00058814-867 at 818, 842, 846.

⁵⁸⁰ GOOG-SONOSNDCA-00058814-867 at 818.

⁵⁸¹ GOOG-SONOSNDCA-00073183-239 at 197-200.



I also note that Google's Christopher Chan testified to [REDACTED]

[REDACTED] ⁵⁸² Additionally, Mr. Chan noted that while he may not view the companies as "directly competitive," there is "some overlapping functionality" and that "in certain cases" there exists competition in the smart speaker market.⁵⁸³

In an email from October 2011, Google's Head of TV Technology, Vincent Dureau, [REDACTED]
[REDACTED].⁵⁸⁴ In May 2015, a Google employee asked other Google employees, [REDACTED]

[REDACTED]
[REDACTED] 586

In January 2016, a [REDACTED]

⁵⁸⁷ An April 2016

email shows that a [REDACTED]

[REDACTED] 588

In a March 2016 email, [REDACTED]

[REDACTED] [REDACTED]
[REDACTED] [REDACTED]

Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Favors Licensor

⁵⁸² Deposition of Christopher Chan, November 29, 2022, pp. 115-118.

⁵⁸³ Deposition of Christopher Chan, November 29, 2022, pp. 106-107, 117-118.

⁵⁸⁴ GOOG-SONOSNDCA-00073639; GOOG-SONOSNDCA-00073640-655 at 644.

⁵⁸⁵ GOOG-SONOSNDCA-00074185-187 at 185.

⁵⁸⁶ GOOG-SONOSNDCA-00074546-548 at 546.

⁵⁸⁷ GOOG-SONOSNDCA-00074740.

⁵⁸⁸ GOOG-SONOSNDCA-00074918-921 at 918.

⁵⁸⁹ GOOG-SONOSNDCA-00074794-796 at 794.

⁵⁹⁰ GOOG-SONOSNDCA-00074794-796 at 794.

⁵⁹¹ GOOG-SONOSNDCA-00074802-805 at 802.



14.6 Factor #6: The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.

In addition to the incremental advertising and subscription revenue which Google generates once a user is included in its ecosystem, users are more likely to purchase additional hardware products from the same manufacturer. For instance, according to an article from 2018 in *The Verge*, Google is building an ecosystem in the smart home which “works better if you use more than one Google device.”⁵⁹² Instead of just purchasing one speaker, the goal is to encourage users to purchase additional Google hardware products to expand their selection with integrated devices.⁵⁹³ In this aspect, once a user joins the Google ecosystem by purchasing a smart speaker device, they are much more likely to purchase a second smart speaker also made by Google rather than another manufacturer, such as Sonos.

In addition, Sonos internal documents discuss the future loss associated with a user locked into a competitor’s ecosystem. Once a user or household purchases a Google hardware device, Google generates a great deal more revenue from that user or household. That initial lost sale to Sonos then becomes a loss of additional future sales because the user or household is locked into an ecosystem effect where like-manufacturer devices are preferred for integration. As an example, an October 2018 survey titled “Smart Speaker User Survey: Questions for Sonos” reported that 53% of Google smart speaker owners chose Google again when they purchased their second smart speaker.⁵⁹⁴ As *Fast Company* explained in March 2018: “The business motivations are clear: Tech giants like...Google...see the smart home as new territory to conquer through their respective ecosystems...As a result, the more you buy into one system, the more you become locked out of others.”⁵⁹⁵ Christopher Chan, a Google employee, testified that once a consumer enters the Google ecosystem, it’s Google’s hope that they buy subsequent speakers from Google as well.⁵⁹⁶

Each hardware device added to the ecosystem also has the ability to generate even more additional revenue from Google’s valuable search and data businesses. Google’s strategy to increase the number of users who interact with Google hardware devices drives further revenue generation and increases the lifetime value of users.

[REDACTED]

[REDACTED] includes reference to an article from October 2017 in *The Verge* which states that, from a hardware strategy perspective, Google’s focus “has been trying to get people connected to Google’s services in the home.”⁵⁹⁸ In addition, a *Wired* article from

⁵⁹² Bohn, D., “The Google Assistant smart home ecosystem is slowly starting to take shape,” *TheVerge.com*, <https://www.theverge.com/2018/11/14/18093872/google-assistant-smart-home-broadcast-reply-routines>.

⁵⁹³ Bohn, D., “The Google Assistant smart home ecosystem is slowly starting to take shape,” *TheVerge.com*, <https://www.theverge.com/2018/11/14/18093872/google-assistant-smart-home-broadcast-reply-routines>.

⁵⁹⁴ SONOS-SVG2-00063422-438 at 428.

⁵⁹⁵ SONOS-SVG2-00056412-428 at 415.

⁵⁹⁶ Deposition of Christopher Chan, November 29, 2022, pp. 109-110.

⁵⁹⁷ SONOS-SVG2-00041807-860 at 816.

⁵⁹⁸ Bohn, D., “Google Hardware Is No Longer a Hobby,” *TheVerge.com*, <https://www.theverge.com/2017/10/4/16405184/rick-osterloh-interview-new-google-hardware-vision-htc-deal>.



February 2018 describes how Google's hardware strategy is to “[p]ut its virtual assistant everywhere in people's lives.”⁵⁹⁹ In an analyst report for Alphabet Inc. from December 2018, RBC Capital Markets stated that “[w]e believe that Google's growing Hardware segment has also generated significant strategic benefits for the company, including increased ad monetization opportunities, an end-to-end, controlled method of delivering software/product updates to consumers, and a platform to develop and deploy AI advancements.”⁶⁰⁰

An October 2021 *Seattle Times* article titled “Big Tech’s not-so-secret plan to monetize your home” describes how Amazon, Apple, and Google use artificial intelligence assistants inside smart speakers to “decide what information to provide you, where you can shop and how seriously to take your privacy.”⁶⁰¹ Google and Amazon “are eager to give consumers a taste of their respective digital assistants, Alexa and Google Assistant, at impulse-buy prices, hoping to lock in customers and profit from later sales of goods and data about buying habits.”⁶⁰² Most recently, a November 2022 article noted that while Amazon’s Echo product line is among the “best-selling items on Amazon...we want to make money when people use our devices, not when they buy our devices.”⁶⁰³

Google’s infringement of Sonos’s patented inventions has helped and will help Google generate significant revenue from driving its users to make purchases such as streaming music subscriptions and retail purchases via and for use with Google’s Cast-enabled media players. For example, an NPR “smart speaker” survey found that 28% of survey respondents agreed that “[g]etting [a] Smart Speaker led [them] to pay for a music service subscription,” and Google offers two such subscriptions – Google Play Music and YouTube Music.⁶⁰⁴ Likewise, the NPR survey also found that 26% of respondents use their smart speakers “regularly” to “add [items] to shopping list.”⁶⁰⁵

Google has also produced a number of [REDACTED]

When limited to the United States, Google [REDACTED] and [REDACTED]

607

⁵⁹⁹ SONOS-SVG2-00041807-860 at 846.

⁶⁰⁰ SONOS-SVG2-00055463-490 at 463.

⁶⁰¹ Fowler, G., “Big Tech’s not-so-secret plan to monopolize your home,” *SeattleTimes.com*, <https://www.seattletimes.com/business/technology/big-techs-not-so-secret-plan-to-monopolize-your-home/>.

⁶⁰² Nellis, S., and Paresh, D., “Amazon and Google probably lost money on their smart speakers over Christmas,” *BusinessInsider.com*, <https://www.businessinsider.com/amazon-and-google-probably-lost-money-on-smart-speakers-over-christmas-2018-1>.

⁶⁰³ Amadeo, R., “Amazon Alexa is a ‘colossal failure,’ on pace to lose \$10 billion this year,” *arstechnica*, <https://arstechnica.com/gadgets/2022/11/amazon-alexa-is-a-colossal-failure-on-pace-to-lose-10-billion-this-year/>.

⁶⁰⁴ SONOS-SVG2-00042345-383 at 365.

⁶⁰⁵ SONOS-SVG2-00042345-383 at 359; SONOS-SVG2-00042337-344 at 342.

⁶⁰⁶ GOOG-SONOSNDCA-00115771-813; GOOG-SONOSNDCA-00115896-913; GOOG-SONOSNDCA-00115914-925.

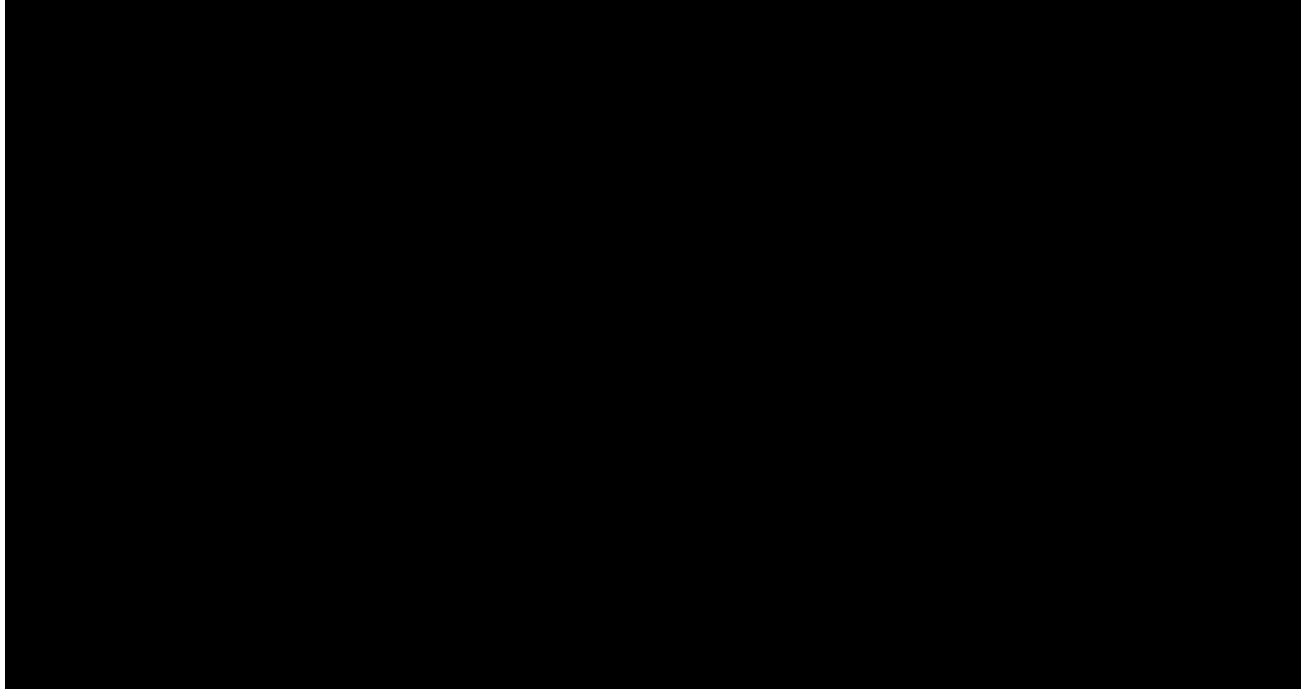
⁶⁰⁷ GOOG-SONOSNDCA-00115771-813 at 774.



INTELLECTUAL CAPITAL EQUIITY

[REDACTED] 608 [REDACTED]
In the U.S., [REDACTED]
[REDACTED] 609 [REDACTED]

Figure 47: [REDACTED] 610



In another [REDACTED]

⁶¹¹ According to this analysis, [REDACTED]

⁶⁰⁸ GOOG-SONOSNDCA-00115771-813 at 774.

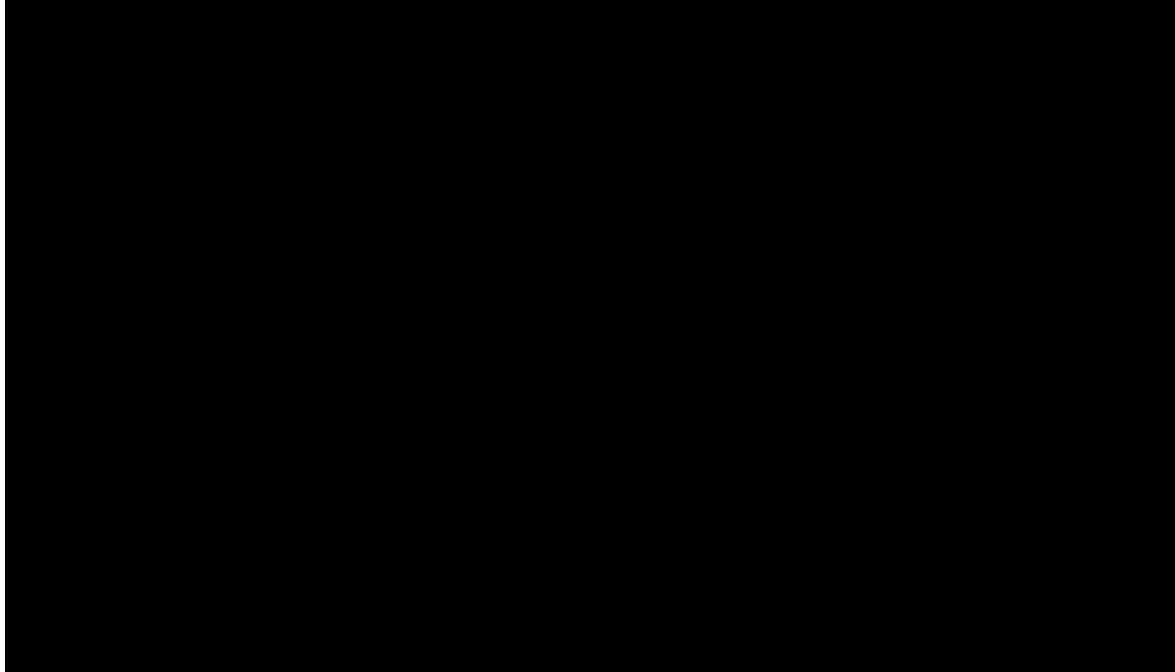
⁶⁰⁹ GOOG-SONOSNDCA-00115771-813 at 775, 780.

⁶¹⁰ GOOG-SONOSNDCA-00115771-813 at 775.

⁶¹¹ GOOG-SONOSNDCA-00115896-913 at 897, 911.

**Figure 48:**

612



In addition, this same document describes that having a [REDACTED]

613

Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiations: Favors Licensor

14.7 Factor #7: The duration of the patent and the term of the license.

Long-term, non-exclusive licenses tend to have lower rates so as not to incentivize the licensee to design around the patented technology, implement an alternative technology or otherwise discontinue sales of a licensed product. Conversely, short-term, non-exclusive licenses tend to have higher rates.

I have assumed that the license resulting from the hypothetical negotiation would extend through the life of the '033 Patent. Assuming a hypothetical negotiation occurring during the period leading up to September 15, 2020, and the expiration of the '033 Patent occurring on or around December 30, 2031, I consider the term of the license to be approximately 11.5 years.⁶¹⁴ I would consider this to be a long-term license.

⁶¹² GOOG-SONOSNDCA-00115896-913 at 913.

⁶¹³ GOOG-SONOSNDCA-00115896-913 at 898.

⁶¹⁴ U.S. Patent No. 10,779,033, p. 1; "US10779033," *Google Patents*, <https://patents.google.com/patent/US10779033B2/en?oq=10779033>.



I have similarly assumed that the license resulting from the hypothetical negotiation would extend through the life of the '885 Patent. Assuming a hypothetical negotiation occurring during the period leading up to November 24, 2020, and the expiration of the '885 Patent occurring on or around September 11, 2027, I consider the term of the license to be approximately 6.5 years.⁶¹⁵ I would consider this to be a mid-to-long-term license.

I have similarly assumed that the license resulting from the hypothetical negotiation would extend through the life of the '966 Patent. Assuming a hypothetical negotiation occurring during the period leading up to November 5, 2019, and the expiration of the '966 Patent occurring on or around September 11, 2027, I consider the term of the license to be approximately 7.5 years.⁶¹⁶ I would consider this to be a mid-to-long-term license.

Therefore, I find that this consideration would tend to favor the licensee in this hypothetical negotiation.

Impact on Hypothetical Negotiations: Favors Licensee

14.8 Factor #8: The established profitability of the product made under the patent; its commercial success; and its current popularity.

The profitability, commercial success, and popularity of the products made under the Asserted Patents are illustrated by the profitability, commercial success, and popularity of Sonos's Patent-Practicing Products and Google's Accused Instrumentalities.

As discussed in Section 9, the Sonos devices which practice the Zone Scene Patents include the Sonos One, Sonos Play:5, and Sonos Five.⁶¹⁷ These products are sold in the Sonos speakers revenue category.⁶¹⁸ A substantial majority of Sonos revenue comes from sales of its speakers.⁶¹⁹

As shown in the figure below, from fiscal year 2016 through fiscal year 2022, Sonos generated \$4.1 billion in gross profit on \$9.1 billion in sales, for an average gross profit margin percentage of 44.6%.⁶²⁰ Sonos's gross profit margin percentage on sales increased from 44.8% in fiscal year 2016 to 45.4% in fiscal year 2022.⁶²¹

⁶¹⁵ U.S. Patent No. 10,848,885; "US10848885," *Google Patents*, <https://patents.google.com/patent/US10848885B2/en?oq=10848885>.

⁶¹⁶ U.S. Patent No. 10,469,966, p. 1; "US10469996," *Google Patents*, <https://patents.google.com/patent/US10469966B2/en?oq=10469966>.

⁶¹⁷ Sonos, Inc.'s Preliminary Damages Disclosure Pursuant to Patent Local Rule 3-8, January 25, 2022, p. 7.

⁶¹⁸ Sonos, Inc. Form 10-K for the fiscal year ended October 2, 2021, p. 5.

⁶¹⁹ Sonos, Inc. Form 10-K for the fiscal year ended October 2, 2021, p. 40.

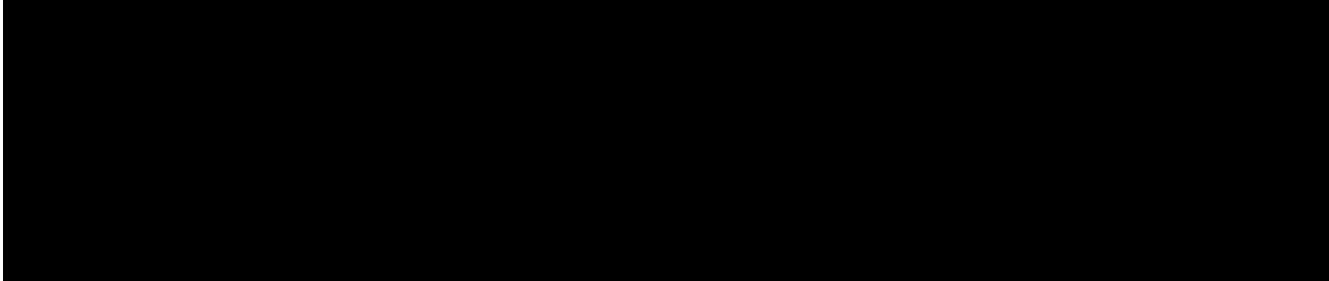
⁶²⁰ Appendix 9.1.

⁶²¹ Appendix 9.1.

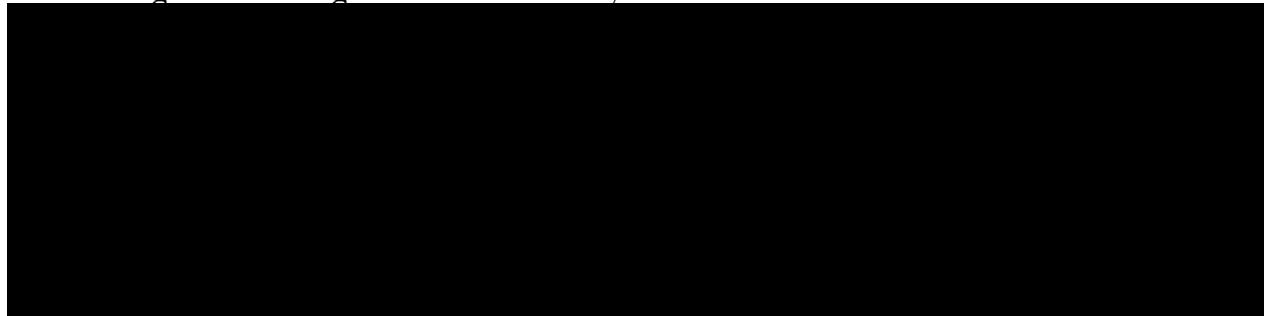
**Figure 49: Sonos's Company-wide Gross Profitability⁶²²**

(in thousands USD)	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Total
Revenue	\$ 901,284	\$ 992,526	\$ 1,137,008	\$ 1,260,823	\$ 1,326,328	\$ 1,716,744	\$ 1,752,336	\$ 9,087,049
Cost of Revenue	497,885	536,461	647,700	733,480	754,372	906,750	955,969	5,032,617
Gross Profit	\$ 403,399	\$ 456,065	\$ 489,308	\$ 527,343	\$ 571,956	\$ 809,994	\$ 796,367	\$ 4,054,432
<i>Gross Profit Margin %</i>	44.8%	45.9%	43.0%	41.8%	43.1%	47.2%	45.4%	44.6%

As discussed in Section 8.1, the '033 Accused Pixel Instrumentalities are composed of Google's smartphone device, tablets, and computers. As shown in the figure below, from September 15, 2020 through Q3 2022, Google [REDACTED] of the '033 Accused Pixel Instrumentalities, for an [REDACTED]⁶²³

Figure 50: Google's Gross Profitability for the '033 Accused Pixel Instrumentalities⁶²⁴

As discussed in Section 8.2, the '885 Accused Instrumentalities are composed of Google's cast-enabled media players, such as Home Mini, Nest Mini, Home, Home Max, Home Hub, Nest Hub, Nest Hub Max, Nest Audio, Nest WiFi Point, Chromecast, Chromecast Audio, Chromecast Ultra, Chromecast with Google TV, and Chromecast with Google TV (HD). As shown in the figure below, from November 24, 2020 through Q3 2022, Google [REDACTED] in net sales of the '885 Accused Instrumentalities, [REDACTED]⁶²⁵

Figure 51-S: Google's Gross Profitability for the '885 Accused Instrumentalities⁶²⁶

⁶²² Appendix 9.1.

⁶²³ Appendix 8.3.

⁶²⁴ Appendix 8.3.

⁶²⁵ Appendix 8.4-S.

⁶²⁶ Appendix 8.4-S.



As discussed in Section 8.3, the '966 Accused Instrumentalities are composed of devices that have installed the Google Home app. However, Google has not provided sufficient information to calculate net revenue or gross profit associated with such devices. I estimate that approximately [REDACTED] have installed the Google Home app over the relevant infringement period.⁶²⁷ Based on the above financial information, it is clear that there is strong demand for the Accused Instrumentalities which use the patented inventions.

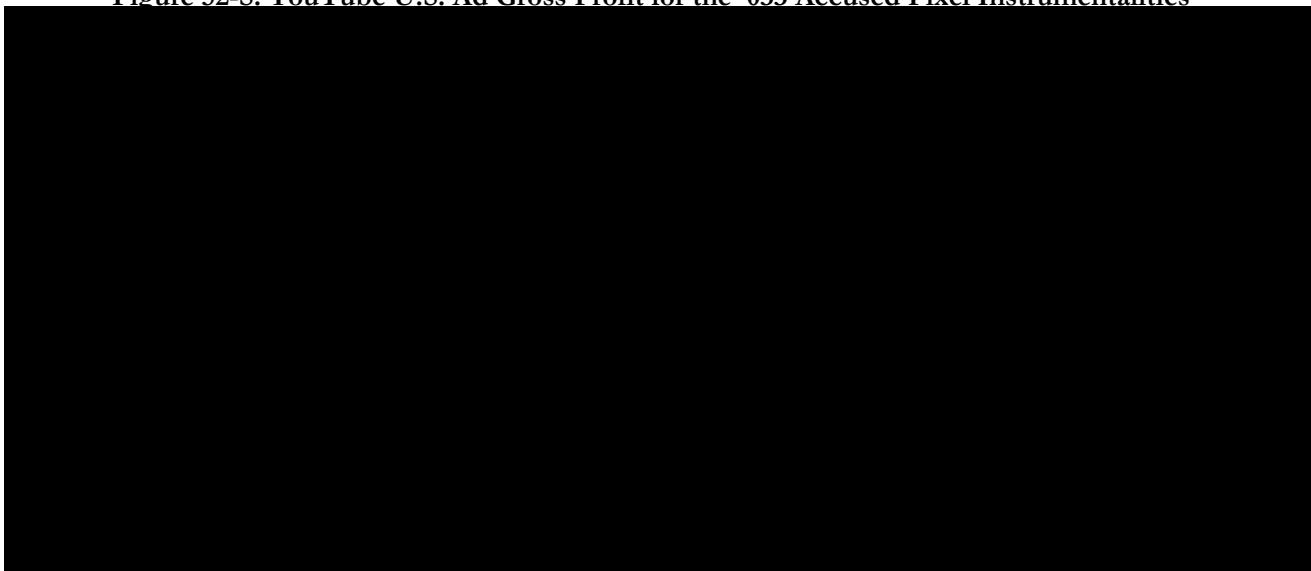
In the context of the hypothetical negotiation, Sonos and Google would recognize that the Accused Instrumentalities provide Google various means to generate revenue. Not only does Google make profits on the sale of cast-enabled devices and hardware products, but Google relies upon the subscription fees and advertising revenue generated through consumer usage of these cast-enabled devices and hardware products. In particular, the parties would consider Google's advertising revenue and profitability and Google's subscription revenue and profitability, in addition to considering the sales of Google's actual device and hardware products.

On YouTube ads generated by the '033 Accused Pixel Instrumentalities in the U.S. from Q3 2020 through Q3 2022, Google [REDACTED]

⁶²⁸ Google's [REDACTED]

⁶²⁹

Figure 52-S: YouTube U.S. Ad Gross Profit for the '033 Accused Pixel Instrumentalities⁶³⁰



On YouTube subscriptions generated by the '033 Accused Pixel Instrumentalities in the U.S. from Q3 2020 through Q3 2022, Google [REDACTED]

⁶³¹ Google's [REDACTED]

⁶²⁷ Appendix 7.4.

⁶²⁸ Appendix 5.2.1.1-S.

⁶²⁹ Appendix 5.2.1.1-S.

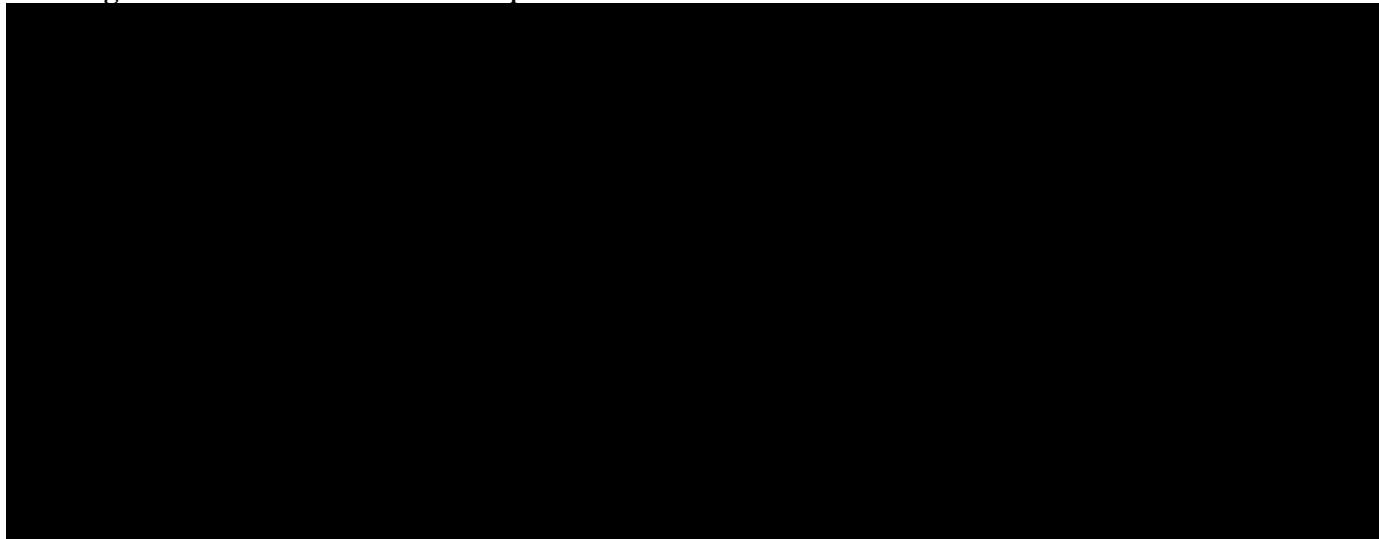
⁶³⁰ Appendix 5.2.1.1-S.

⁶³¹ Appendix 5.2.2.1-S.



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Figure 53-S: YouTube U.S. Subscription Gross Profit for the '033 Accused Pixel Instrumentalities⁶³³



I have not been provided with financial documents identifying additional ad or subscription revenue which was generated by the '885 Accused Instrumentalities. Similarly, I have not been provided with financial documents identifying additional ad or subscription revenue which was generated by the '966 Accused Instrumentalities.

Google enjoys substantial revenue and gross profits from the Accused Instrumentalities, which are both popular and commercially successful. Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Favors Licensor

- 14.9 **Factor #9: The utility and advantages of the patented property over old modes or devices, if any, that had been used for working out similar results.**

- 14.10 **Factor #10: The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.**

Factors 9 and 10 are frequently analyzed together due to their similarity and inherent overlap.

As discussed in Section 6.1, I understand that Sonos contends that Google infringes claims 1-2, 4, 9, 11-13, and 16 of the '033 Patent.⁶³⁴ Based upon the Opening Schmidt Report, I understand that the '033 Patent's

⁶³² Appendix 5.2.2.1-S.

⁶³³ Appendix 5.2.2.1-S.

⁶³⁴ Opening Schmidt Report, p. 4.



direct control technology enables a user to transfer play back of media from a personal computing device, such as a mobile phone, to one or more playback devices, such as a smart speaker, and thereafter control the playback on the one or more playback devices via the user's personal computing device.⁶³⁵

According to Dr. Almeroth:

The '885 and '966 Patents are directed to Sonos's "zone scene" technology, which, at the time of the invention, provided a new way of grouping networked media players such as smart speakers together for synchronous playback of media.⁶³⁶

As discussed in Section 6.2, I understand that Sonos contends that Google infringes claim 1 of the '885 Patent. This claim cover aspects of Sonos's zone scene technology from the perspective of a zone player, such as a speaker.⁶³⁷ According to the Dr. Almeroth, "Google and its customers derive substantial benefit from Google's use of the claimed technology of the '885 Patent and '966 Patent in the Accused Google Controllers and Accused Google Players."⁶³⁸

Dr. Almeroth states that, "the claimed 'zone scene' technology enables Google's customers to use the Accused Google Controllers to create and save predefined groups (referred to by Google as 'speaker groups' or 'static groups') of Accused Google Players, including groups that have one or more overlapping Accused Google Players, where each such group can later be launched at any time via the Accused Google Controllers to cause the Accused Google Players in the previously-saved, predefined group to become configured to play back audio in synchrony. In this regard, the claimed technology provides significant advantages."⁶³⁹

The Opening Almeroth Report explained the following regarding the time-saving advantage of the claimed 'zone scene' technology:

For instance, the ability to use the Accused Google Controllers to create and save predefined speaker groups of Accused Google Players that can later be launched on demand for synchronized playback provides advantages over other technology for grouping "zone players" in a networked multi-zone audio system that requires a user to create a group from scratch each time the user wishes to listen to synchronized audio on a different group by selecting the particular "zone players" to include in the group in an ad-hoc manner, one-by-one, at the time that the group is to be activated for synchronous playback... As the '885 Patent notes, this ad-hoc grouping process "may sometimes be quite time consuming," because each time the user wishes to activate a different group for synchronous playback, the user has to repeat the ad-hoc process of selecting each of the "zone players" to include in the group even if it is a grouping of "zone players" that has previously been formed and activated by the user on many other occasions in the past... By incorporating Sonos's claimed "zone scene" technology into the Accused Google Controllers and the Accused Google Players, a user can create and save as many speaker groups as desired using the Google Home app, and then later listen to synchronized audio on any one of the pre-saved speaker groups on demand by simply selecting the speaker group for launch via, for example, the Google Home app, Google's YouTube Music app, or the Spotify app. This is advantageous because instead of having to create

⁶³⁵ Opening Schmidt Report, pp. 12-19.

⁶³⁶ Opening Almeroth Report, p. 33.

⁶³⁷ Opening Almeroth Report, pp. 39-40.

⁶³⁸ Opening Almeroth Report, p. 304.

⁶³⁹ Opening Almeroth Report, p. 304.



each group from scratch by selecting the Accused Google Players to include in the speaker group in a “time consuming” ad-hoc manner at the time the user wishes to activate the group for synchronous playback, the user can simply select a pre-saved speaker group for launch.⁶⁴⁰

The ability to create and save multiple predefined speaker groups with one or more overlapping Accused Google Players provides advantages with respect to system flexibility.⁶⁴¹ Using the ’885 Patent claimed technology, a user can listen to synchronous audio on different speaker groups in their home at different times where each speaker group includes an overlapping Accused Google Player.⁶⁴² Such flexibility was not possible with “conventional multi-zone audio system[s].”⁶⁴³

The claimed zone scene technology allows a user the ability to create and save a predefined speaker group of Accused Google Players for future use, without causing the speaker group to be activated for synchronous playback.⁶⁴⁴ This is particularly advantageous for a user who has no intention on using a new speaker group at the time of its creation but is instead proactively creating and saving a speaker group for future use.⁶⁴⁵

The claimed zone scene technology also “allows a user to create and save predefined speaker groups using the Google Home app on an Accused Google Controller but then later launch any one of the previously-saved, predefined speaker groups by selecting the speaker group via a different Cast-enabled app such as Google’s YouTube Music app or the Spotify app, which are both media content streaming apps.”⁶⁴⁶ This capability is advantageous for users who prefer to control their Accused Google Players from a third party media content streaming app.⁶⁴⁷ Without the ’885 Patent claimed technology, a user would not be able to launch a speaker group for synchronous playback via the YouTube Music app or Spotify app.⁶⁴⁸

The same can be said for the ’966 Patent, which also covers Sonos’s zone scene technology, albeit from the perspective of a computing device or controller, such as a smartphone. Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Favors Licensor

14.11 Factor #11: The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.

As described above, I understand that the asserted claims of the ’033 Patent enables a user to transfer play back of media from a personal computing device, such as a mobile phone, to one or more playback devices,

⁶⁴⁰ Opening Almeroth Report, pp. 304-305. Internal cites omitted.

⁶⁴¹ Opening Almeroth Report, p. 305.

⁶⁴² Opening Almeroth Report, p. 305.

⁶⁴³ Opening Almeroth Report, p. 305.

⁶⁴⁴ Opening Almeroth Report, p. 305.

⁶⁴⁵ Opening Almeroth Report, p. 306.

⁶⁴⁶ Opening Almeroth Report, p. 307.

⁶⁴⁷ Opening Almeroth Report, p. 307.

⁶⁴⁸ Opening Almeroth Report, p. 307.



such as a smart speaker, and thereafter control the playback on the one or more playback devices via the user's personal computing device.⁶⁴⁹ As found in internal Google documents, public articles, and Google marketing materials, the Accused Instrumentalities have throughout the damages period, enjoyed immense popularity, and widespread success among customers.

As discussed in Section 12.2.1 above, I have reviewed [REDACTED]



⁶⁵² I rely on this figure below to calculate incremental revenue generated by the '033 Accused Pixel Instrumentalities.

Therefore, I calculated the portion of total time spent watching YouTube while using Direct Control, which resulted in [REDACTED].⁶⁵³ Given the other evidence discussed below, I believe that this is a conservative measure of the prevalence of Direct Control usage by Google customers. Dr. Schmidt also opined that he has reviewed "evidence of Google documenting and touting the widespread use of the accused Cast functionality facilitated by Google's MDx/Orbit architecture that practices the asserted claims of the '033 Patent."⁶⁵⁴

Other data relating to the prevalence of casting usage by Google consumers, such as a Q2 2019 presentation on the current casting user interface and new features, indicate that users [REDACTED] of YouTube via casting worldwide daily.⁶⁵⁵ The figure below, taken directly from that presentation, calculates that [REDACTED] are responsible for these viewing hours, which accounts for [REDACTED]⁶⁵⁶

⁶⁴⁹ Opening Schmidt Report, pp. 12-19.

⁶⁵⁰ GOOG-SONOSNDCA-00116342; updated at GOOG-SONOSNDCA-00117796.

⁶⁵¹ Deposition of James Goddard, July 19, 2022, pp. 42-45; GOOG-SONOSNDCA-00116342; GOOG-SONOSNDCA-00117796; discussions with Counsel. The spreadsheet reflects hours of U.S. watch time.

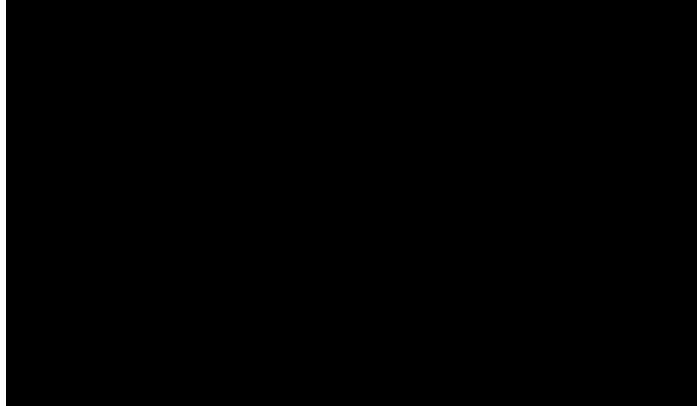
⁶⁵² Deposition of James Goddard, July 19, 2022, pp. 64-66; Appendix 5.5. If, however, one includes manually paired casting hours, this share rises to [REDACTED].

⁶⁵³ Calculated as [REDACTED]).

⁶⁵⁴ Opening Schmidt Report, pp. 141-142.

⁶⁵⁵ GOOG-SONOSWDTX-00051544-607 at 546.

⁶⁵⁶ GOOG-SONOSWDTX-00051544-607 at 546. Emphasis in original.

**Figure 54: YouTube Casting Usage⁶⁵⁷**

On the qualitative side, numerous Google webpages focus on enabling customers using Direct Control features, through Google Nest, Google Home speakers, YouTube.com, the YouTube app, and Chrome. The figures below are presented as examples of this marketing by Google.

Figure 55: Google Marketing of Direct Control via YouTube.com and YouTube App⁶⁵⁸

Cast from the YouTube app and YouTube.com

Watching your favorite YouTube videos on your TV has never been easier.

Cast from YouTube

1. Make sure your mobile device or computer is connected to the same Wi-Fi network as Chromecast.
2. Open the YouTube app  or YouTube.com.
3. Tap the Cast button . Tip: On the YouTube app, the Cast button is at the top of the Home screen. From YouTube.com on your laptop, it's in the bottom right corner of the player.
Note: You can also open YouTube.com and [cast directly from Chrome browser](#).
4. Tap the Chromecast device you want to cast to > tap Play. Your content will start playing on the TV connected to that Chromecast device.
5. To stop casting content, tap the Cast button  > Disconnect.

⁶⁵⁷ GOOG-SONOSWDTX-00051544-607 at 546.

⁶⁵⁸ GOOG-SONOSWDTX-00005981.



Figure 56: Google Marketing of Direct Control via Google Nest or Google Home Speaker⁶⁵⁹

Play media from Chromecast-enabled apps to your Google Nest or Google Home speaker or display

Android iPhone & iPad

Playing music on Google Nest or Google Home device is a simple way to enjoy your favorite audio apps optimized for your speaker. You can even use your mobile device or tablet as a remote and control everything from playback to volume.

Step 1. Cast from Chromecast-enabled apps to speaker or display

1. Make sure your mobile device or tablet is [connected to the same Wi-Fi network](#) or [linked to the same account](#) as your speaker or display.
2. Open a Chromecast-enabled app.
3. Tap the Cast button
4. Tap the speaker or display you'd like to cast to.
5. When you're connected, the Cast button will turn from light to dark gray, letting you know you're connected.
6. You can now cast audio and video to your speaker or display from your device.
7. To stop casting, tap the Cast button at the top of your device. Tap Stop Casting in the box that appears.

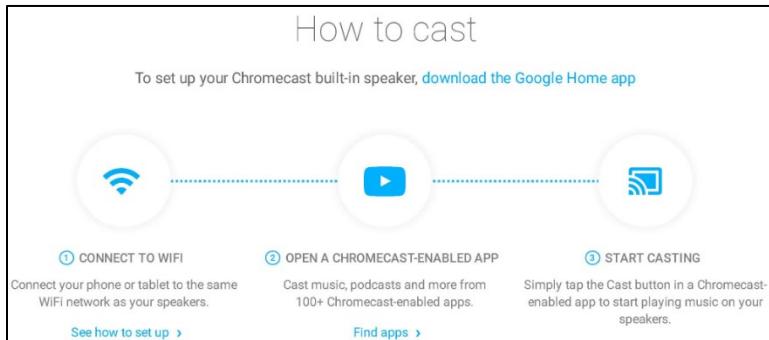
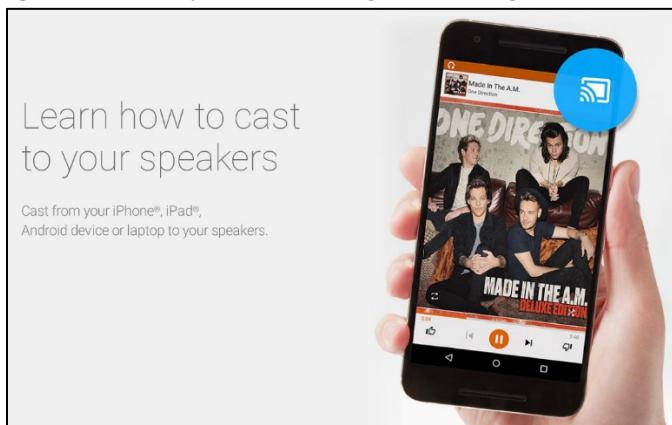
Google also promotes the ability to cast from non-Google hardware as well. The figures below depict instructions of how to cast from Chromecast-enabled applications, as well as Apple products such as the iPhone or iPad. By May 2015, just two years after it was released, Chromecast dongle had sold over 17 million units worldwide, according to then-Head of Android Sundar Pichai.⁶⁶⁰ Similarly, an article published by Google on Chromecast states that “people are tapping the Cast button more than ever. And since Chromecast, the Made by Google family of products has continued to grow, bringing the best of hardware, software, and AI together.”⁶⁶¹ As the I/O 2015 keynote speaker, Mr. Pichai stated that the Play Store was home to around 20,000 Cast-ready apps.⁶⁶²

⁶⁵⁹ GOOG-SONOSWDTX-00005631-636 at 631.

⁶⁶⁰ Roettgers, J., “Google Sells 17 Million Chromecast Devices, Clocks 1.5 Billion Casts,” *Variety*, <https://variety.com/2015/digital/news/google-sells-17-million-chromecast-devices-clocks-1-5-billion-casts-1201506974/#>.

⁶⁶¹ GOOG-SONOSWDTX-00008118-119 at 118.

⁶⁶² Herrick, J., “Chromecast sales approach 20 million, people just love the Cast button,” *TalkAndroid*, <https://www.talkandroid.com/250517-chromecast-sales-approach-20-million-people-just-love-cast-button/>.

**Figure 57: How to Cast Using a Chromecast-Enabled Application⁶⁶³****Figure 58: Ability to Cast Using Non-Google Hardware⁶⁶⁴**

Internal Google documents [REDACTED]

⁶⁶⁶ These included [REDACTED] as well as development efforts with [REDACTED]

[REDACTED] – running Cast.”⁶⁶⁷ The figure below identifies the TV manufacturers Google was working with at the time.

Figure 59: Google Cast for TV Manufacturers⁶⁶⁸

⁶⁶³ GOOG-SONOSWDTX-00005760-761 at 760.

⁶⁶⁴ GOOG-SONOSWDTX-00005760-761 at 760.

⁶⁶⁵ GOOG-SONOSWDTX-00039410-457 at 417.

⁶⁶⁶ GOOG-SONOSWDTX-00039359-409 at 360.

⁶⁶⁷ GOOG-SONOSWDTX-00039359-409 at 366-367.

⁶⁶⁸ GOOG-SONOSWDTX-00039359-409 at 367.



Google Cast for TV: Program Announcement

VIZIO

TOSHIBA

PHILIPS

MAGNAVOX
SMART. VERY SMART.

 **Polaroid**

While I was able to quantify casting's share of YouTube watch time, I understand that Google has not produced any data relating to the prevalence, usage, and/or intensity of such usage regarding its speaker grouping or zone scene technology. As such, I again identified numerous marketing documents that indicate such capabilities are expected from, and therefore extensively used by, Google consumers. The figures below display Google's marketing the ability to group speakers (among other devices), allowing a user to "create your own audio system."

Figure 60: Grouping Google Assistant Devices⁶⁶⁹

Group your Google Assistant devices

You can create groups of speakers, Smart Displays, and Smart Clocks so all of your devices play the same audio throughout your house.

This feature doesn't work on Bose or Sonos speakers that have the Google Assistant.

What you need

You need two or more of the devices listed below. You can group speakers, Smart Displays, and Smart Clocks in any combination.

- Google Home
- Google Nest Speakers
- Chromecast (2nd generation and above)
- Smart Displays with Google Assistant
- Chromecast Audio
- Speakers with Chromecast built-in
- Smart Clock

⁶⁶⁹ GOOG-SONOSWDTX-00005768-769 at 768.

Figure 61: Creating Speaker Groups⁶⁷⁰

Google also promotes the ability to group Nest speakers in multiple saved configurations: “If you have more than one Google or Nest smart speaker or display, simply create as many different groups as you’d like in the Google Home app, and enjoy music, podcasts and more throughout your home.”⁶⁷¹

I also understand that Dr. Schmidt has opined that the ’033 Patent provides significant advantages in the field of networked, multimedia playback systems, such as Google’s Chromecast, Home, and Nest multimedia systems, and is foundational technology in this field.⁶⁷² Further, Dr. Schmidt stated:

I further note that I have seen evidence of Google recognizing the importance of the technology of the Asserted Claims of the ’033 Patent. For example, I have seen evidence of Google documenting and touting the widespread use of the accused Cast functionality facilitated by Google’s MDx/Orbit architecture that practices the asserted claims of the ’033 Patent. See, e.g., GOOG-SONOSWDTX-00042838 [Orbit: Project Portal], 839 [REDACTED]

845

848 (“Orbit brings the best of the mobile and TV experience together.”), 924-25, 926 [REDACTED]

GOOG-SONOSWDTX-

00037264

673

Regarding the Zone Scene Patents, Dr. Almeroth provided examples of Google’s use of the claimed technology:

For instance, Google markets both the ability to create and save predefined speaker groups for future use via the Google Home app on an Accused Google Controller and the ability of Accused Google Players in a speaker group to playback audio in synchrony. See, e.g., GOOG-SONOSWDTX-00007068-74 at 68 (Google webpage marketing ability to “[g]roup any combination of Google Nest or Google Home speakers and displays and Chromecast devices together for synchronous music throughout the home.”); GOOG-SONOSWDTX-00008449-50 at 49 (Google webpage marketing ability to “group any combination of Google Nest speakers, displays, and Chromecast devices together to play music in multiple rooms...”); SONOS-SVG2-00055666-668 at 66 (Google webpage marketing ability to “group any combination of Google Nest or Home speakers and displays, and Chromecast devices together to play music in multiple rooms...”); SONOS-SVG2-00055660-661 at 60 (Google webpage marketing ability to “create groups of

⁶⁷⁰ GOOG-SONOSWDTX-00006518-520 at 518.

⁶⁷¹ GOOG-SONOSWDTX-00005212-214 at 212.

⁶⁷² Opening Schmidt Report, p. 139.

⁶⁷³ Opening Schmidt Report, pp. 141-142.



speakers, Smart Displays, and Smart Clocks so all of your devices play the same audio throughout your house.”); SONOS-SVG2-00055113 (Google marketing video touting ability to create and save speaker groups).

Similarly, Google’s internal documents also recognize the importance of being able to play synchronous audio on speaker groups of Accused Google Players. See, e.g., GOOG-SONOSWDTX-00040384 at 85 [REDACTED]

[REDACTED] GOOG-SONOSNDCA-00056732-77 at 38.⁶⁷⁴

Given the quantitative factors indicating extensive use of the direct control technology, along with qualitative factors of zone scene usage and promotion from Google marketing materials, I believe that Google has made extensive use of the Accused Instrumentalities. Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Favors Licensor

14.12 Factor #12: The portion of the profit or the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.

Similar to Factors #1 and #2, Factor #12 also relates to the Market Approach and considers licenses and licensing practices within the relevant industry.

As above, I have considered relevant agreements in my use of the Market Approach. Therefore, the impact of this factor is reflected in my quantitative analysis described above in Section 12.1.

Impact on Hypothetical Negotiation: Considered in Market Approach

14.13 Factor #13: The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.

Factor 13 extends the analysis performed in Factors #8 and #11 and relates to the portion of the realizable profit that should be attributed to non-patented elements. Analysis of this factor is sometimes related to the Income Approach in the context of intellectual property valuation, which I have addressed above in Section 12.2. As discussed above, the Income Approach attempts to value an asset by measuring the benefits derived from use of the asset. When used in the context of an intellectual property licensing situation, these benefits are then split in some fashion between the licensee and licensor. The split has the twin effects of giving the licensor reasonable compensation for the use of its intellectual property, and the licensee reasonable compensation for assuming the business risks associated with developing, manufacturing, promoting, and selling the product that embodies the particular technology.

In apportioning the realizable value of the Asserted Patents between Sonos and Google, I have considered Google’s reputation, its promotional efforts, and the normal business risks incurred by Google, as well as

⁶⁷⁴ Opening Almeroth Report, p. 308.



their know-how related to the Accused Instrumentalities. In the context of the Asserted Patents, Sonos would act similarly to an app developer who wishes to provide its technology for a fee. This is comparable to the companies who offer the comparable casting applications which I discuss in Section 12.1.5. These comparable applications are offered on the Google Play Store and generate revenue either through advertisements or paid subscriptions. Similarly, with respect to the '885 Patent and '966 Patent, IFTTT is also provided as a subscription-based plan. Therefore, I consider Sonos to be similar in the regard that it would provide the technology claimed in the Asserted Patents based on this business model. In this case, Sonos and Google would look to Google's "Services fees" which are provided on a Google Support webpage. Specifically, the service fee for developers with earnings in excess of \$1M per year is 30%.⁶⁷⁵

Figure 62: Google Play Store Service Fees⁶⁷⁶

Service fees

Apps and in-app products sold through Google Play's billing system or an Additional Billing System (as defined below) in accordance with the [Payments policy](#) are subject to a service fee.

As of January 1, 2022, that service fee is equivalent to:

- For developers who are enrolled in the [15% service fee tier](#), the service fee is:
 - 15% for the first \$1M (USD) of earnings each year,
 - 30% for earnings in excess of \$1M (USD) each year.
- For developers who are not enrolled in the [15% service fee tier](#), the service fee is 30%.
- For automatically renewing subscription products purchased by subscribers, the service fee is 15%.

I understand that this business model is already in use and widely accepted by app developers and Google. For instance, to list an app on the Google Play Store, Google charges a 30% "standard commission on apps and in-app purchases of digital goods and services."⁶⁷⁷ Additionally, Google has entered into a revenue-sharing agreement with Apple in which it paid \$1 billion to keep search bar on the iPhone.⁶⁷⁸ This agreement would give Apple a percentage of the revenue Google generates through the Apple device – this rate was testified during pretrial information to be 34%.⁶⁷⁹

Therefore, the revenue split between an app developer who is providing an application and Google who is hosting the application on the Play Store, has already been decided and appropriately compensates each party for the risks it bears. In my opinion, at the hypothetical negotiation, the parties would consider that, had

⁶⁷⁵ Google, "Service Fees," [Google.com](https://support.google.com/googleplay/android-developer/answer/112622?hl=en), <https://support.google.com/googleplay/android-developer/answer/112622?hl=en>.

⁶⁷⁶ Google, "Service Fees," [Google.com](https://support.google.com/googleplay/android-developer/answer/112622?hl=en), <https://support.google.com/googleplay/android-developer/answer/112622?hl=en>.

⁶⁷⁷ Google, "Service Fees," [Google.com](https://support.google.com/googleplay/android-developer/answer/112622?hl=en), <https://support.google.com/googleplay/android-developer/answer/112622?hl=en>; Campbell, I., and Alexander, J., "A Guide to Platform Fees," [TheVerge.com](https://www.theverge.com/21445923/platform-fees-apps-games-business-marketplace-apple-google), <https://www.theverge.com/21445923/platform-fees-apps-games-business-marketplace-apple-google>.

⁶⁷⁸ SONOS-SVG2-00056406-407.

⁶⁷⁹ SONOS-SVG2-00056406-407.



Google had a license to sell Sonos's Direct Control and Zone Scene technology, the business relationship would be similar to that with an app developer. To appropriately account for Google's contribution to the incremental revenue and margins it has generated through the Asserted Patents, Google would receive 30% and Sonos would receive 70%.

Therefore, I find that this consideration would tend to favor the licensor in this hypothetical negotiation.

Impact on Hypothetical Negotiation: Favors Licensor

14.14 Factor #14: The opinion testimony of qualified experts.

The extent to which I have considered the opinion testimony of qualified experts is reflected throughout my report. I reserve the right to supplement my opinions upon the review of other expert reports and testimony that are provided after the date of this report.

Impact on Hypothetical Negotiations: Considered Throughout My Report

14.15 Factor #15: The royalty that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee – who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention – would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Factor #15 describes the integration of the other factors within the willing buyer/willing seller hypothetical negotiation framework. As the name implies, the parties in the negotiation are presumed to be willing. They both seek, as businesspersons, to reach an agreement. Another key factor in this hypothetical negotiation is that both parties are assumed to "lay their cards on the table" so that each understands the other's position. Lastly, the hypothetical negotiation considers facts that are known or knowable at the time and presumes that the Asserted Patents are valid and infringed by the Accused Instrumentalities.

Some of the considerations discussed throughout this report which would frame the hypothetical negotiation are summarized below:

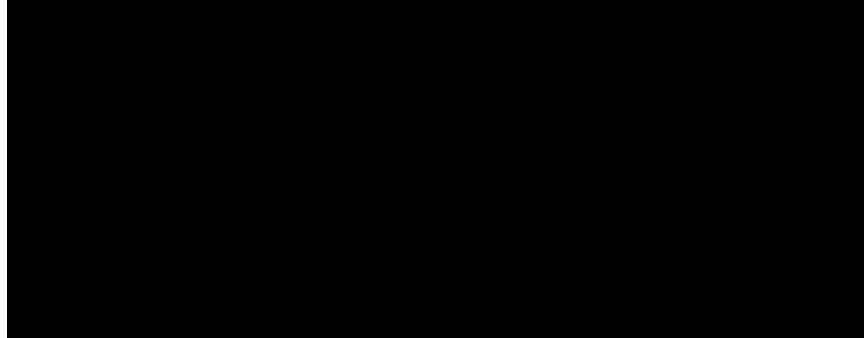
- The parties would have considered that neither Sonos nor Google have entered into technically and economically comparable license agreements which can be used to determine an appropriate royalty rate indicator;
- The parties would have considered third-party comparable applications and would have considered a \$1.99 one-time subscription fee per device to be an appropriate quantitative indicator for the '033 Patent;
- The parties would have considered the incremental per-device advertising and subscription revenue attributable to the '033 Patent of [REDACTED], respectively to be appropriate quantitative indicators for the '033 Patent;



- The parties would have considered the apportioned net present value of the zone scene technology of \$1.24 to \$2.48 per device to be appropriate quantitative indicators for the '885 Patent;
- The parties would have considered the apportioned net present value of the zone scene technology of \$1.17 to \$2.35 per device to be appropriate quantitative indicators for the '966 Patent;
- The parties would have considered that Google's hardware products are sold as a loss leader to increase the Google ecosystem and the lifetime value of users through advertising and subscriptions;
- The parties would have considered the technical utility and advantages of the Asserted Patents and the lack of non-infringing, commercially acceptable alternatives;
- The parties would have considered Google's services fees for application developers of 30% and Sonos's share of 70% as fair sharing of the value of the Asserted Patents.

In consideration of the *Georgia-Pacific* Factors, it is my opinion that Sonos would be in a relatively stronger bargaining position than Google in the hypothetical negotiation in this case. Based upon Google's demonstrated revenue sharing with app developers, it is my opinion that Sonos would keep 70% of the revenue generated from Google's infringing use. Therefore, I have applied Sonos's 70% revenue share to each of the quantitative indicators I have calculated above which are based upon revenue as a starting point. With respect to the affirmative direct control revenue methodology described in Section 14.13, I have applied the 70% share to the advertising revenue direct control quantitative indicator of [REDACTED] resulting in an advertising revenue royalty rate due Sonos of [REDACTED].⁶⁸⁰ I have similarly applied the 70% share to the subscription revenue direct control quantitative indicator of [REDACTED] resulting in a subscription royalty rate due Sonos of [REDACTED]⁶⁸¹

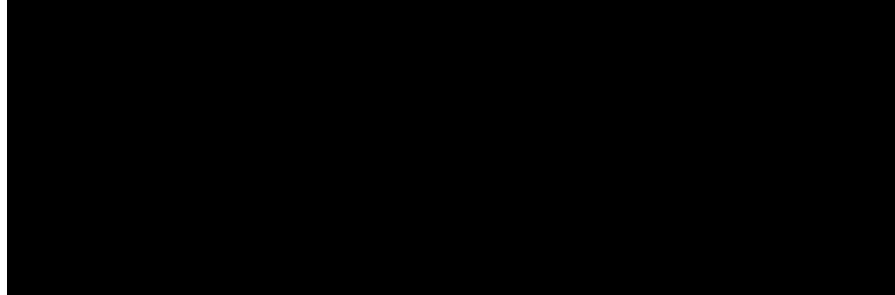
Figure 63: '033 Patent Advertising Revenue Royalty Rate⁶⁸²



⁶⁸⁰ Appendix 5.1.1.

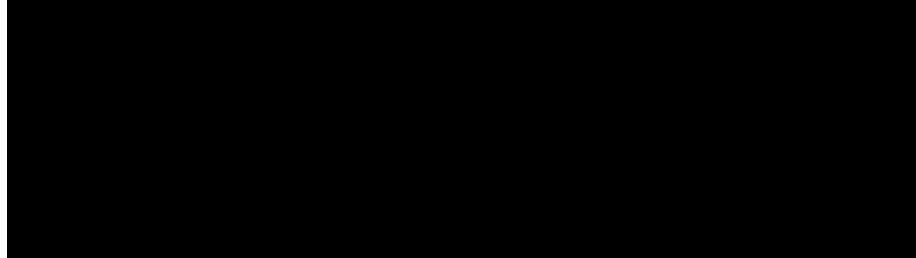
⁶⁸¹ Appendix 5.1.2-S.

⁶⁸² Appendix 5.1.1.

**Figure 64-S: '033 Patent Subscription Revenue Royalty Rate⁶⁸³**

Alternatively, if the trier of fact determines that it is necessary to begin with margin, I have similarly calculated direct control quantitative indicators based upon Google's advertising and subscription margins. However, given that these calculations are based upon margins, and not revenues (which the 70%/30% revenue applies), I have not performed the same 70%/30% revenue sharing split as with the calculations which begin with revenue. Further, in utilizing the margin as a starting point, Google has already realized its costs and the remaining profit is the incremental profit Google has earned based upon the infringing technology. Therefore, with respect to the direct control quantitative indicators beginning with margin, 100% of the margin is due Sonos. The margin quantitative indicators remain the same at [REDACTED] for advertising profit and [REDACTED] for subscription profit.⁶⁸⁴

With respect to the alternative direct control comparable application methodology described in Section 14.13, I have applied the 70% share to the [REDACTED] quantitative indicator resulting in an alternative direct control royalty rate of [REDACTED] per '033 Accused Instrumentality.

Figure 65: Alternative '033 Royalty Rate⁶⁸⁵

Similar to the methodology for Direct Control, I have also applied the 70% revenue share to the quantitative indicators I have calculated for the '885 Patent. Assuming Sonos would keep 70% of the zone scene quantitative indicators results in \$0.87 to \$1.74 per '885 Accused Instrumentality.⁶⁸⁶

⁶⁸³ Appendix 5.1.2-S.

⁶⁸⁴ Appendices 5.2.1-S and 5.2.2-S.

⁶⁸⁵ Appendix 6.2.

⁶⁸⁶ Appendix 4.1.2.

**Figure 66: '885 Patent Royalty Rate⁶⁸⁷**

Metric	Low	High
'885 Patent Quantitative Indicator	\$ 1.24	\$ 2.48
Sonos's Share Based on Revenue Split	<u>70.0%</u>	<u>70.0%</u>
'885 Patent Royalty Rate	\$ 0.87	\$ 1.74

Similar to the methodology for the '885 Patent, I have also applied the 70% revenue share to the quantitative indicators I have calculated for the '966 Patent. Assuming Sonos would keep 70% of the zone scene quantitative indicators results in \$0.82 to \$1.64 per '966 Accused Instrumentality.⁶⁸⁸

Figure 67: '966 Patent Royalty Rate⁶⁸⁹

Metric	Low	High
'966 Patent Quantitative Indicator	\$ 1.17	\$ 2.35
Sonos's Share Based on Revenue Split	<u>70.0%</u>	<u>70.0%</u>
'966 Patent Royalty Rate	\$ 0.82	\$ 1.64

Based on the foregoing analysis and the quantitative indicators and qualitative factors discussed above, it is my opinion that the parties to the hypothetical negotiation would conservatively agree to a royalty rate of [REDACTED] per device for Google's use of the '033 Patent, a royalty rate of \$0.87 per device for Google's use of the '885 Patent, and \$0.82 per device for Google's use of the '966 Patent, all in connection with the Accused Instrumentalities.⁶⁹⁰

15. DETERMINATION OF REASONABLE ROYALTIES

Based on the totality of the circumstances in this case and the information available to me at this time, I have concluded that the appropriate form of compensation in this case, for each of the Asserted Patents, is an award of reasonable royalty damages.

I have analyzed quantitative and qualitative valuation metrics, including the *Georgia-Pacific* factors, and have reached a conclusion regarding the appropriate reasonable royalties due Sonos. Regarding the '033 Patent relating to Direct Control, in my opinion, the total royalty rate is [REDACTED].⁶⁹¹ Alternatively, the royalty rate for

⁶⁸⁷ Appendix 4.1.2.

⁶⁸⁸ Appendix 4.2.2.

⁶⁸⁹ Appendix 4.2.2.

⁶⁹⁰ Appendices 3.1-S, 5.1.1 and 5.1.2-S. [REDACTED]
royalty rate.

⁶⁹¹ Appendices 5.1.1 and 5.1.2-S. [REDACTED]



INTELLECTUAL CAPITAL EQUITY

19. SIGNATURE

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James E. Malackowski".

James E. Malackowski

December 9, 2022

Date



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